

THE ACCOUNTING PROCESS AND THE EFFECT  
ON THE QUALITY OF TRANSACTIONS AND DEVELOPMENT

By

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by

Julia Anne McDaniel

This work is lovingly dedicated to my family  
for making my career-making wilderness  
and work especially, for reaching me  
the true meaning of structure and learning.

J. A. B. , 1979

If the U. S. succeed in twisting a man  
in a terrible proof, you had to take care  
to find his share he actually is and he  
begins there, so he is still help to a  
person, not that understood some that  
he does, but in the very first place,  
not that understood that he understands

Chomsky's

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THE SOCIOCULTURAL IMPACTS AND THE IMPACT  
CONDUCTED OF TRANSLATION AND INTERPRETATION

By

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The increasing number of families in which women have progressed  
beyond careers by professionals attempting to enhance the quality of  
life for the family. As time passes it becomes clear that the young women  
and her infant are at risk for problematic development; yet our present  
system of knowledge are limited in number and view interventions that  
exist. The primary purpose of this study was to assess the contributions  
of the mother's age, parental risk status, and socioenvironmental,  
cultural and educational resources to the prediction of the development of  
the mother-infant transaction process and the developmental status of  
the infant. A second purpose of the study was to determine the ability  
of the transaction dimensions to predict the mental and psychomotor  
development of the infant.

The data were collected in a clinical setting in an urban/ethnic  
sample of 11 mothers and their six-month-old infants. The mental and  
psychomotor development of the infant was evaluated using the Bayley  
Scales of Infant Development. Mother-infant transaction was analyzed

using the Adapted Infant's Behavior Scale (Angeles, 1986). The questionnaire-based items were obtained from the Child and Family Environment Interview, which was developed for use in this study.

In order to reduce the number of variables and define the conceptual dimensions of mother-infant connection, a correlation matrix of the 11 variables of the Adapted Infant's Scale was subjected to a principal components analysis. As a result of this analysis, five dimensions of mother-infant connection were defined and each subject's composite score was calculated for each of the five related components.

In the third multivariate multiple regression analysis, the dimensions of mother-infant connection and the infant's mental and psychomotor development were considered to be the outcome measures of early pregnancy and parenting. These measures were regressed up mother's age and education, baby's sex and birth order, parity, income, ethnic origin, social support system, prenatal risk status, prenatal complications and the type of prenatal care received by the mother.

The follow-up univariate analyses indicated that the age of the mother and the degree of prenatal complications had a positive relationship with the infant's mental development. The place of the residence indicated no deviation from literacy. It was concluded that there was a positive linear relationship between these variables and the infant's mental development. The type of prenatal care received by the mother contributed to the prediction of the infant's mental development. The follow-up principal components of each type of prenatal care indicated significantly higher scores for infants whose mothers received Teenage Pregnancy (see table 1) comparatively earlier than received in these groups (most-very late than a private physician

and Ranch Teaching Hospital High Risk Clinic (children were only). The data did not support the hypothesis that mother-infant interaction would be a function of the age of the mother.

In order to determine the utility of the transactional approach to predict the development of the infant, a nested multivariate multiple regression analysis was implemented. The dimensions of mother-infant transaction were found to contribute a significant proportion of shared variance to the infant's psychomotor development. The component of transaction which constituted a uniquely significant proportion was responsive vocalization.

Based upon the results of the following hierarchical analyses, the variables which were identified as predictors of mental development were: 1) the age of the mother, 2) the type of prenatal care received by the mother, and 3) the presence of prenatal complications. Psychomotor development was found to vary as a function of: 1) responsive vocalization of the mother during transaction process, and 2) the type of prenatal care received by the mother. The regression coefficients indicated that for each year of mother's age, the infants differed, on the average, by 2.8 points on the Mental Development Index and by 2.2 points on the Psychomotor Development Index.

The results of this study suggest that the interests of young mothers are at risk for problematic development and would benefit from early intervention efforts. The data also supported the idea that the mother-infant relationship is important to the infant's development of competence. Based upon the findings presented in this study, we have reason to believe that more comprehensive interdisciplinary models of prenatal, perinatal and postnatal support are warranted.

with enhanced development of the infant. These findings suggest several considerations for the design of parent and infant-oriented interventions for the young parent family in order to enrich the quality of care and stimulation provided by the adolescent mother and thus enhance the development of the infant.

## CHAPTER I

### INTRODUCTION

The emergence of a phenomenal mother of infancy to adolescence mothers has generated serious concern by professionals attempting to enhance the quality of life for the individual and the family. While there exists numerous studies which explore the various aspects of early pregnancy and parenting, very little is known about the nature of the relationship between the adolescent mother and her infant and the infant's development.

What are the characteristics of the very young mother -- how do her behaviors differ from or resemble those of her "her age" peers? How does she relate to her baby and what are the effects of her style of relating to her baby and the developing family unit? Answer, in short, questions pose a challenge to the researcher and are in need of investigation. Such is the task at hand. Most importantly, this study attempts to explore the role of the adolescent as a mother in an effort to understand her strengths and limitations and their implications for her baby's development.

It is the purpose of this study, therefore, to examine the relationship between infant development and mother-infant interaction in the adolescent family. The information obtained as a result of this study will assist professionals by increasing their understanding of the developmental status of the infant and the parenting style of the young mother in order to design more comprehensive programs for the young family.

The essence of "comprehensible care" involves a thorough understanding of the situation, undertaking the tasks of early parenthood. It is through this understanding that our interdisciplinary efforts may become more sensitive to the complex needs of the young mother, her infant and her family. The commitment to quality care implies a change in the part of the professional community—a change based on empirical evidence which documents the educational and developmental competence and capabilities of the very young mother. By focusing on the challenges within the family, our efforts will project a more supportive quality. It is this belief in the positive characteristics of young parents—courage, resourcefulness, adaptability and above all, an optimistic view of the future—that is the philosophy upon which this study is based.

#### Infant and Family Development: The Scope of the Problem

The disturbing aspect of early parenthood has become a source of great concern to the research community. In 1979, the Guttmacher Institute reported that about 13 percent of American adolescents became pregnant each year—some within young women. Twenty-five percent of these women have chosen to keep their babies. What happens to these young families remains a challenging question.

The early years of parenthood, even under the best optimal circumstances, are commonly viewed as a transitional period—one in which the individual is attempting to establish equilibrium and adjust to the responsibilities of becoming a parent, of caring for another human life (Good, 1980; Fisher, Samuels, Wilson and Samuels, 1979). This may be an extremely stressful period for all members of the family

The impact of the transition to parenthood on the individuals involved as it related to future parent-child interaction has been the subject of many content studies. Levine's (1975) findings suggest critical interactional components through which the mother forms the beginning of attachment to the infant. The stages include: 1) planning along the pregnancy, 2) overfeeding the pregnancy, 3) accepting the pregnancy, 4) acknowledgment of fetal movement, 5) acceptance of the fetus as an individual, 6) birth, 7) seeing the baby, 8) touching the baby, and 9) giving name to the baby. Russell's (1979) examination of 111 samples and their 4-24 week old infants supports the view that the transition to parenthood is a critical situation which involves a reorganization of the family's social structure. This change in family relationships was noted to be influenced by nine parents' relevant experiential factors noted by Russell from self-report checklists were: 1) the pattern of communication which affected the planning of the birth and a positive adjustment to marriage, 2) a high degree of commitment to the parenting role, 3) good maternal health, 4) a supportive baby, and 5) preparation for parenthood. These factors are considered in magnitude in the developmental tasks of the adolescent mother.

An essential concern for the very young mother is her ability to cope with the individualized aspects of parenthood and to facilitate positive transactions with her child. The five factors discussed above suggest the need for further exploration as they involve the very specific developmental tasks: 1) the adolescent's acquisition of an independent concept of self, and 2) the parent's role transition from an individual to a member of either a dyad or a triad. When she completes the major tasks of each of these tasks separately and then as becoming thirdness, the realization of the young mother and her baby becomes progressively more developmental.



In view of general concern in the literature about the mother and her limitations for the development of the mother, her baby and the developing family unit. ALLEGRETTI has shown by the mothers have updated RECENTLY THE FACTOR. During the child stage in living with the extended family, relatives or friends. The participation of the father of life. EYMAN have been the final point of several studies which have noted the "burnout and isolation" of early parenting (Parslow, 1970). Negative outcomes have been related to: 1) a loss of educational and vocational skills, 2) family impoverishment due to the high incidence of repeated pregnancies in the adolescent population (Shore, 1970) 3) a 50 percent divorce rate for pregnant adolescents the early, 4) a higher degree of medical complications and risks during prenatal and neonatal periods for mother's lacking in prenatal care (Peters and Jones, 1970), and 5) a lack of preparation for the parenting role (Gitter, 1970, Hughes et al., 1971) resulting in a lack of skills in facilitating parent-child relations. as well as a high degree of suspected child abuse (Belamoney, 1970).

The positive outcomes of early parenting are difficult to accept and often are even difficult to accept. More staggering than the above findings of young mothers and their physicians was the risks in question are the inevitable outcomes of today's reality. The supervisor faced by the mother in her school, professional environment and community is particularly more demanding than early parenthood could. In effect, this says to our nation, 'you can't be a good mother, you're too young!'. If our efforts are to be successful, we must meet our needs and maintain a positive presentation in order to understand the role of the adolescent as a parent.

#### The Effects of Parent-Child Interaction and Family Development.

The past decade has witnessed considerable research in the area of maternal characteristics with respect to family composition and capabilities. The data indicated that the mother enters with the

essentially integrated systems of responses (Korbo, 1971). The ability of the sensory system to receive and the central nervous system to process information is referred to as 'responsive readiness'. From this point, 'adaptive readiness' allows the infant to cope with and modify the environment accordingly. It is this reciprocal relationship between the infant and the environment which is described as transaction and which forms the basis upon which future development and learning grow. The attachment formed as a result of these first transactions becomes pivotal and renders this human experience as an understanding of development.

Of primary significance to the newborn are those individuals with whom the first contact is made and a relationship established--the mother, father and other family members. Numerous studies have dealt with the expectations of these first bonding experiences--those which establish the attachment of one individual to another through the various meanings of sensory stimulation and affectionate words (Blauvelt, 1977; Bell, 1971; Brunson, 1970; Gross and Kemell, 1976; Lamb, 1977). The use of direct and extended observations of dyadic communication has been an useful means of exploring the parent-child relationship. The analyses of structural patterns and behavioral components in the observations have indicated that several specific variables are directly related to the infant's language, cognitive, and psychosocial growth (Glick-Tenent, 1971). These variables include affectionate words, face-to-face orientation, and response (rather than direction) behavior and vocalizations. It is these experiences which are the focal point of this study. Of special interest is the relationship between the mother's ability to interact in a manner which is responsive to the needs and capabilities

of his infant and the infant's ability to participate in a "reciprocal" manner.

In summary, the research indicates that the infant is a competent human being--capable of responding to and with the environment. The infant possesses many competencies, yet is unable to perform certain tasks, and must depend on other individuals for life sustaining and enhancing functions. The quality of the care provided for the infant is the vital element which will promote the most positive growth during the child's first three years of life (London, 1980). That includes an emphasis on the quality of care provided by the very young mother. While the study of early parenthood was ongoing, the strengths of the young mother have yet to be especially "documented" in assessment of the strengths and limitations of the mother-infant relationship and the infant's development still then contributes toward a more thorough understanding of their needs and will make it possible to design more comprehensive services for the young family.

#### Variables Investigated in the Study

The independent variables were investigated in the study are age of the mother, education of the mother, sex of the infant, birth order, prenatal risk status, socio-economic status, social support system, reliability and participation in prenatal treatment and childbirth and parenting education programs. The relationships between and among the independent and dependent measures of infant development and mother-infant interaction were investigated in an overall test of an associative between the two sets of variables. Follow-up tests on the specific variables under investigation indicated the degree to which they contributed to the prediction of developmental outcomes.

The general questions addressed in this study were investigated as follows:

- 1) Is infant development and mother-infant transmission vary as a function of the age of the mother?
- 2) Is the relationship between the mother's age and each dimension of transmission and infant development linear after controlling for all other independent variables?
- 3) What is the nature of the relationship between prenatal medical care and development at six months after controlling for all other independent variables?
- 4) Which variables contribute predictive information to the identification of developmental delays in infant development measures at six months?
- 5) Is there a positive relationship between the extent of prenatal and peripartum parenting education and infant development and mother-infant transmission at six months?
- 6) Is there a positive relationship between the extent of the mother's social support system and transmission and the infant's development?

#### Summary

The purpose of this study was to investigate the transmissional relationship between the adolescent mother and her infant and the infant's development. We have reason to believe that the young mother and her infant are at risk for problematic development, for our current sources of information are limited to mother and yield inconsistent findings. This study was designed to explore the unique contributions

of morphological, method and structural variables by which to increase our understanding of the results of the young mature and ripe fishes. As a result, our interdisciplinary efforts to provide comprehensive services will be able to become more sensitive to the special needs of the young family.

## CHAPTER II

### THE NATURE OF THE PROBLEM

This study was designed to explore the transactional relationship between the very young mother and her infant and her infant's development in order to understand the implications of early parenthood on the mother and her baby. It is necessary to synthesize the literature from several sources of knowledge.

The variables which are the focal point of the present study -- parental and perinatal risk factors and developmental, medical and educational outcomes -- are presented in this section as they relate to the sequential development of the adolescent as a mother. Specific discussions of the role of the extended family and psychological influences on the young woman undergoing the transition to parenthood are presented within the context of each phase of the transition. These topics are also discussed as they relate to the development of the child born to a very young mother.

As noted previously, the adolescent undertaking the task of motherhood faces both a transition from her family of origin to psychological independence and the transition to the responsibilities of parenthood. Her relationship with her baby and her baby's growth can be viewed as a function of the mother's ability to establish

emphasizes in three two-dimensional stages of development. The literature reviewed in this chapter has therefore been selected from two distinct fields: 1) the study of parent-infant transaction as it is related to infant development, and 2) the special study of adolescent parenting.

A review of the research related to young mothers' transaction with their infants is limited by the fact that there exists but one observational study to date (Hodges et al., 1972). For this reason, non-specific studies of the mother-infant relationship and transaction process as they relate to infant development are presented as a basis for understanding the process and the aspects which involve the young mother and her infant. The presentation of this material is such a manner is based on the assumption that there are certain universal aspects of mothering and infant development and that there are contributions to the study of adolescent mother-infant transaction if to expand the scope of this study to deal with the many issues associated with adolescent pregnancy, except as they concern the role of the mother and her baby's development.

#### Parent-Child Transaction and Infant Development

The acceptance of current information regarding the mother's responses and capabilities has been accompanied by investigations of the earliest years of a child's life and those the play significant roles in the development of the child. The child's concept of self forms a major basis for the developmental process and has been thought to be related to early transactions between the mother and infant. When the concept of self is viewed as a learned property that

that as women physicians, the child's self-concept appears to develop as a function of the growth process through transactions with people of significance. Gordon (1970) summarized much about the development of the self in infants and young children about 1950-60:

These original images of themselves are formed in the early months. They develop the notions of who they are in relation to people around them, particularly through ways in which their behavior is rewarded by others who are important (and they) the origins of self-concept are the images of interactions with his parents and the feelings he develops about experiences (the self they receive) the reflecting and evaluative function of behavior (and learning) . . . and in the use of subjective judgments he makes with regard to himself and his experiences. (p. 74)

In this way, prelinguistic feelings about self are connected and reflective for future development because children

It becomes important then to take in the more global studies of the parent-infant relationship. In this way we may better understand the development of the adolescent as a mother and the ramifications of this period for the growth of her child.

How does the mother-infant relationship begin? What is meant by the term attachment and bonding and how do they affect future development? How can we better extend our understanding of these abstract concepts with more concrete evidence? These questions have prompted a considerable amount of research concerning the relation of the mother's first experience with the baby (Maccoby, 1972; Bell, 1974; Berman, 1972; Blass and Howell, 1974; Lamb, 1977) but we review Maccoby's (1972) discussion of the interrelated components through which the mother forms the beginning of attachment to the infant. The stages include: 1) planning the pregnancy; 2) nurturing the pregnancy; 3) accepting the pregnancy; 4) acknowledgment of fetal movement; 5) acceptance of the fetus as an individual;



6) *birth*, 7) *seeing the baby*, 8) *touching the baby*, and 9) *giving care to the baby*.

In view of the findings by Tolmark and Sennar (1978) regarding the large number of unplanned births to adolescent women, the subsequent development of feelings of attachment to the infant remains in question. This is reinforced by the fact that the pregnancy is often concealed and acknowledged in the second or third trimester. Such factors pose additional threats to the relationship between the adolescent mother and her infant. The delayed confirmation and acceptance of the pregnancy have remained unlinked with respect to their impact on the adolescent mother-infant relationship and are in need of further exploration.

When considered within the framework of social learning and experiences, the feelings brought by the mother to the infant associated with her mother are a product of her identification with her mother-in-law, the influence of believing and believing, cultural influences, values and expectations (Kline and Russell, 1978). The role of the very young mother's environment and family of origin has thus been an important area studied with respect to early pregnancy and parenting for (1978) noted the family's individualized impact on the adolescent as a social "environment" which is operationalized through childbearing system and by the quality of the relationships between youth within the family and among family members.

In studies of maternal-infant attachment, Ainsworth (1978) has examined the qualitative characteristics of interaction from the study of separation and has offered some defining indicators of

attachment as a phenomenon. This attachment is viewed as an asymmetrical, reciprocal involving free and unfree attempts to gain proximity in the primary caretaker. Attachment differs from dependency in that it involves an affective preference for contact or noncontact interaction, as opposed to the desire for the fulfillment of a physical need. Attachment is established through the process of mutual gazing and the establishment of eye contact with the mother. Bowlbians have shown that gazing is followed by locomotor approach. Lamb (1970) stressed the need to view these characteristics as a series of later-related components of behavior which are unique individual expressions and may be viewed as a part of a response to the transactional process. Behaviors are then classified to meet acceptable criteria without threatening attachment as a concept.

It is stated to categorize structured protocols and behavioral responses and to quantify optimal maternal behavioral variables. Several studies have focused attention on direct and developed dimensions of dyadic interaction. Bowlbians et al. (1970) stated that "It is through an early system of affective interaction that the development of an infant's identification with others, freely and other individuals will be affected" (p. 48). The study examined twelve pairs of mothers and infants involved in three-minute interaction over a twelve week period. Behaviors such as vocalizations, head position, duration of gaze, body position, amount of movement and handling revealed that the quality of each parent's actions were in direct relationship to the other. The behaviors were viewed as an indication of intentional affectivity and indicated that each parent utilized

and initiated reciprocally in response to feedback from the other individual. The sequence of phases which emerged from the observed flow of the mother-infant dyad comprised: 1) initiation, 2) mutual orientation, 3) greeting, 4) play dialogue, and 5) disengagement. This 'ritual' of the infant's social self-regulation was interpreted from observational representations as both regulatory and affective - and the mother's ability to enhance the infant's attending to her for important cues.

Gask (1977) supported the notion that the infant's active participation is directly related to a sensitivity to signals. He concluded, however, that it is as yet unclear whether infants take behaviour which elicits a response, or whether they regulate their own behaviour to engage in reciprocal interaction as a function of their intellectual competence. The question of the infant's competence in evoking a response has also been investigated by Rameyoff (1977). He suggested that a critical feature of the transaction for success in interaction would be the recognition plan in the infant and the ability of the infant to modify the environment. Rameyoff and Bell (1978) acknowledged the infant's contribution to the transaction process in the same manner:

Whether the role may be played by the baby's characteristics in stabilizing the bilateral pattern of mother-infant interaction, it seems quite clear that the mother's contribution to the interaction and the baby's contribution are caught up in an interacting spiral. It is because of these spiral effects, some 'virtuous' and some 'vicious' - that the interaction can be understood that it is not possible to distinguish independent from dependent variables. (p. 140)

The increasingly active infant contributes to the mother-infant transaction process remains in need of further exploration.

The effects of the quality of mother-infant interaction on the development of both mother and infant has been investigated in a longitudinal intervention trial which study of 200 Singapore women who in reported observations, interviews and developmental assessments found support for a chain of initial experience in the infant and a dependence upon the mother's through reciprocal transactions (Clarke-Stewart, 1979). Findings indicated a significant relationship between maternal affection, responsiveness, and expression of affection and the child's developmental changes and growth, emotional, cognitive, and language competence. The most influential factor was found to be the quality, rather than mere quantity, of initial stimulation. Other important factors included the mother's role as an environmental mediator, her expression of positive emotion, and frequency of responsiveness, stimulation, or affectionate behavior as it related to the child's competence. The data suggested that responsiveness to the infant's behavior had a direct effect on it and only indirect causal effect, "but created an opportunity of control within the infant which generalized to new situations and unfamiliar people" (Clarke-Stewart, 1971, p. 307). Other studies indicated maternal involvement with the female immediately after birth as having positive effects on the mother's psychological state and her ability to respond to her newborn (Pantli, 1974; Kline, Kessel and Evans, 1971).

The fact that many scientists in search of within the support of the father contributed a "late" discussion of current studies which have recognized the importance of the father's role and his transaction with the infant. To name is a self-report questionnaire and interview, *Men and Development* (1971), outlined the nature of the transition to fatherhood with respect to the individual's relationship and the effect of women

preparation for childbirth. While it was noted that there was a high correlation between the husband-wife relationship and the adjustment to prenatal changes, mutual preparation in childbirth was emphasized as facilitating adjustment after birth. What appeared meaningful in the transition from fetal to infant was the mother's "father" established as a result of the father's participation in the birth. Total adjustment was found to correlate negatively with the disruption of affection and intimacy, a decreasing amount of time spent with the wife, and a discrepancy between the father's expected and actual mothering role due to breast feeding. This aspect of early marriage and childbirth has been virtually ignored with respect to early parenting (Coleman, 1979).

Studies of fathers' involvement have suggested the importance of the father-mother relationship. Parks and Parks's (1979) observations of fathers, both with the mother and alone with the newborn, indicated that the fathers were equally involved in establishing eye contact, holding, monitoring and touching the infant. Fathers were also concerned in monitoring reactions, and often assessed the mother's participation. In the context of feeding and an other measure, fathers were found to be sensitive to infant cues and were able to interpret infant behavior and modify their own behavior in response. It was also noted that fathers touched and responded to first-born males more often than to other offspring. Longitudinal studies indicated that those fathers who were given the opportunity to learn and practice skills in the hospital were more typical with infants in the months (Parks and Parks, 1979).

The results of the study on the strength of mother-child and father-child relationships supported the father's role in the child's developing

experiments (Ains 1955). During unstructured free-play in a laboratory playroom, observations of twelve month olds were used to measure the effects of each parent on the interaction process involving the other parent. The effect of a stranger's presence (a structured situation) was also investigated in this study. The findings indicated a significant behavioral effect in the presence of both parents on both mother-infant and father-infant relationships. The infant's affiliative behavior -- smiling, reaching and touching -- and interaction during play showed a preference for the father. In a structured situation, however, primary attachment mother and father were less prone of age sought proximity to the mother. Ains (1955) points out that the results of her two studies should not be used to equate affiliation with attachment or as effective preference for one parent or the other.

The findings that early interpersonal transactions are of importance to the young child's development of competence stimulated further investigations into the expanding socialization process. This process has been shown to have a pronounced relationship to brain development in infancy and throughout early childhood. The preminant relationship was shown to be related to the language, social, emotional and mental development measures of infants who were followed from nine to eighteen months of age (Clarke-Stewart, 1977).

Based upon the assumption that the infant is preadapted to selectively attend to stimuli and facilitates adult-infant interaction, numerous studies have explored the notion that responsiveness is an

emergence of the actual achievement of feelings of affinity (Maccoby, 1973; Bell, 1979; Friedman et al., 1979; Kline and Howell, 1979). The parent's dualistic interpretations of the infant's state of arousal have been shown to prompt an appropriate response to stimulation. The extent to which the behavior of significant others can be anticipated from gestural, vocal functions as a determinant of the quality and extent of the infant's responsive vocalization patterns, (1977). The extent of the young mother to interpret the state of her infant and facilitate appropriate stimulation has been questioned by a number of authors (Gibby et al., 1979; Katzewsky, 1971) and was investigated in the present study.

Frederick et al. (1974) studied the parents, infants, family relations with their mothers at one, three and eight months of age through observations in the family home. Her findings indicated that infants whose (mothers) developmental quotient was higher at nine months spent less time today in positive state at one and three months and were given more their freedom at eight months. Higher scores in attachment measures were correlated with more infant's playing during the month observations, with smiling and cooing responses to distress at three months and general responsiveness at eight months. Frederick's (1971) study of maternal attributions and their relation to IQ scores revealed freedom to explore the home, experience with people other than the mother and the adoption and removal studies. Maternal attributions to an important interacting variables which were related to advanced development.

Such research has been undertaken which deals with family connection with skills in an attempt to trace qualitative developmental skills and rate





responding, were significant in the facilitation of emotional and language development. Interacted mothers which supports the effects of encouragement and reflection responses, whereas not seen in laboratory observations of mother-child transactions as facilitating children's verbal spatial visualization and spatial-temporal cognitive styles (Thomas, 1979; Campbell, 1979). In studies relating infancy to early childhood, the child of between three and five years was seen as able to interpret the level of expressiveness and characteristics and not developmentally varying in the ability to differentiate the synchronous verbal transactions of the parent through increasing capacity and decreasing synchronicity (Thomas, 1979). This suggests that from early transactions, the young child comes to learn how to affect another individual. Through this process, the infant (and young child) learns as well that the response of another is an expression of feelings and ideas and that these expressions are directly related to the process of interaction.

### Summary

In summary, the development of the child appears to be strongly associated with the quality of the relationship between mother and infant. These studies which have dealt with the concepts of communication clearly demonstrate that the mother-child relationship is of prime importance in the development of the child. Still, surprisingly little is known about the effects of maternal behavior. When our sources of information have been limited to generalizability. They do, however, acknowledge the need for research regarding the psychological, educational and social risks associated with early childhood. It is hoped that the consideration of the mothering mother in future research will extend our knowledge base. Empirical studies of the young parent family will thus strengthen efforts to improve the quality of professional services to the family as a whole and enhance the quality of life for each individual.

### The Young Mother and the Infant

Childall (1988) would argue that a dangerous opportunity of pregnancy at adolescence can be defined as the point when (perhaps) the infant may well be the dangerous opportunity (Bristol, 2019, p. 147).

This 'dangerous opportunity' is much better referred to as one about which very little is known. The past decade has given rise to great concern about the increasing numbers of adolescents who become parents each year. We have begun to investigate the medical, social, economic, psychological and educational consequences of early pregnancy and parenting, but surprisingly few studies have dealt with the development of the infants of very young mothers. Even less is known about the the young mother related to her high-risk strategies and outcomes in her style of parenting. To date, few the observation of studies exist which document her unique experience in mothering infancy. Our present state of knowledge are thus lacking in relevant information and are limited by a lack of methodological refinement in early research.

Before proceeding to a discussion of the research related to early parenting, it is necessary to explain some of the methodological problems in this area. In the current review of the research, Cohen (1976) and Wolcott, et al. (1978) criticised against the attempt to generalise from selected studies. In early cases, biases in our present content are due to sample selection which were lacking in age appropriacy and inappropriate methodological procedures. Specifically, the analytical treatment of variables such as socio-economic status and mother's age was such that we do not have too much such constructions especially in the extreme domains of early pregnancy and parenting. A problem here is found when researchers

of generalization about the parenting style of adolescents, not only without regard to the design of the given study. For example, many authors described negative behaviors in the adolescent parents (Delmonico, 1975; Fergusson, 1978), but the sampling was such that only adolescents were included. If one is to suggest that young mothers display a higher incidence of dysparenting, it is necessary to include the 'of age' mother in the design. Without this inclusion, we are unable to ascertain the relative contribution of mother's age in her style of parenting. A similar conclusion is placed on generalization from studies of the behavior of adolescent mothers. For this reason, limitations will be noted in early research concerning the young mother and her infant.

In order to better understand the consequences of early childbearing on the mother and her infant it is necessary to compare the young mother to her 'of age' peer. Variations of interest include the trends in birth rates, maternal risks to the neonate and following assessment of the behavior of adolescents. This review will therefore address these issues from the perspective of their relationship to the adolescent's role as a mother and the development of her baby.

### The Biology of Early Pregnancy

In looking specifically at recent research on adolescent parenting, it is evident that there are two distinct categories. One is the study of pregnant teenagers and the second is the study of teenage mothers. In other words, there is a striking definitional difference between a pregnant teenager and becoming a teenage mother. This issue is concerned with the element of choice upon the confirmation of pregnancy. The individual either is able to choose whether to 1) abort or maintain the pregnancy, and 2) give the baby up for adoption or retain the baby for parenthood.

Several disciplines have taken issue with the phenomenal nature of pregnancies which have occurred during adolescence. The biomedical explanations of how and why pregnancy occurs in quite well known and involves the science of human reproduction. From the psychological, more logical and educational perspectives we find that a large number of early pregnancies are also due to young people's lack of knowledge or education about contraception and a lack of confidential family planning services made available to them (Klein, 1978; McIntyre et al., 1979).

The psychological and psychosocial antecedents of early pregnancy are more intricate than as are suggested here with the discussion of human sexuality. From this standpoint, early sexual activity and resultant pregnancy become more comprehensible.

Fordham's (1979) data from a study of girls who become pregnant out of wedlock suggests that "the girls are not pregnant because they are different, but are considered different because they are pregnant" (p. 148). Jones (1988) interpreted this concept in her discussion of the transition to parenthood and its direct relationship to the nature of the individual's attitude toward sexual activity. "The initiation of a pregnancy is not always a voluntary decision, for it may be the unintended consequence of a sexual act that was restrictive in intent rather than protective" (p. 11).

The question of having has been explored by Ehrlich and Ransmay (1978) in their 1971 and 1976 studies of first pregnancies of women between the ages of 15 and 20 years of age. Their findings, based on "National Fertility Survey Statistics", revealed that there has been little change in the proportion of white teens who become sexually active and pregnant each year, but there has been a substantial decline in the number who deliver. The authors stated that "few who become

pregnant is an intentionality, but for the "black pregnant one" correspondence" (p. 11). The black population evidenced little change in the number of their pregnancies and as slight percent decline in perinatal loss/deaths. The authors stated that a discrepancy existed in the number of live births and abortions reported by Florida which was probably due to the separate statistics of the various prenatal services. Florida was noted to report a higher number of live births and fewer abortions than were actually recorded in the National Survey. It is important to note that any information obtained by means of self-report questionnaires and interviews is that which the subject is willing to disclose. This limitation is especially relevant to this study due to the sensitive personal nature of the questions regarding incest. Regardless of the issue, we are faced with the fact that one million adolescents become pregnant each year (Alan Guttmacher Institute, 1990).

Turning to the study of adolescent pathology (or psychopathology) as it may exist, several conflicting studies focus on the personality of the adolescent as an explanation of her sexual behavior. A composite personality profile of the pregnant adolescent is not of a young woman who typically came from a broken home, was sexually active with one partner or a steady boyfriend, reached at early menarche, was sexually impulsive, narcissistic, sociopathic, rejected, hostile, lonely, unempathetic, and/or unprepared (Gale and Undernagel, 1981; Jager, 1981; Laidlaw et al., 1979; Rogers et al., 1987; Salovey, 1987; Glass, 1980; Gertzel, 1980). Another view is that "adolescent parents become pregnant before normal adolescents doing normal adolescent things" (Lindsay, 1987). Each of these studies is characterized by a methodological problem in which the use of small samples or the lack of a comparison group of women over the age of

24 years. A third approach for (1974-75) at 20% is less satisfactory by Gaultier (1976) in answer to the question, "What is the program? What are the goals and why is the program?" Gaultier answered:

"What is the program?" To us these questions implies a policy-ology based program, and these issues are central. In the United States we keep trying to find out what kind of people (or psychological traits) get pregnant non-intentionally--what would we do if we found an answer? We do not seek of married women experiencing unwanted pregnancy "why are you pregnant?" We do support of choice and of control of all females (regardless of the timing individuals were attended by the program). Further, we did other means were available to control conception and abortion, and then move to focus a program to help married women control unwanted pregnancy and birth... We suffer nothing philosophical about the issue of unwanted pregnancy among married women, and it is true to us the issue for unwanted pregnancy women. (p. 17)

### The Growth and Development of the Twin Study Program

One that we have briefly touched the background information regarding pregnancy in adolescence, but we have to the question of the pregnancy, specifically, the decision to continue the pregnancy and become a parent. At the onset of this discussion, a classification is in order. In many instances, there is no choice choice to be made by the pregnant teenage. Unless pregnancy is confirmed during the first twelve weeks of gestation, abortion is no longer an option. In such situations is the natural process being the adolescent which is often adolescent towards abortion. We have reason to believe that is Murphy (1976), but to date, there is a general lack of acceptance of abortion among women of adolescent subjects. This lack of acceptance of abortion as a viable alternative to parenthood should not be construed to mean that teenage women desire or accept early pregnancy and resulting in their offspring. In the contrary, the work of Furstenberg (1979, 1983), Lewis (1976), Shalaby (1981), and Wright (1981) confirmed that feelings of disappointment,

work) changes, and the stress of financial burden over (Hollings-John) are shared among all families of pregnant adolescents, regardless of their cultural origins. The family's reaction to the pregnancy has been shown to be important to the adolescent's development as a mother.

It has been noted frequently throughout this work, as we concerned them with the special ways in which mothers and their infants establish a relationship and grow together. The study of early parenting involves a unique set of characteristics and stages through which the young women must pass.

The first stage following the confirmation of the pregnancy centers the families regarding the newborn. Because the adolescent often feels guilt, shame, and fear upon the acknowledgment (Pruksachan, 1978) this becomes a critical point in her development as a mother. The study of this phase in the transition to parenthood has been synthesized by the three authors who, coming from the different perspectives of developmental and social psychology, have developed theoretically significant theories. The work of Collins (1978), Pruksachan (1978) and Fox (1978) have emphasized the importance to the family (often referred to as "the family of origin") and especially that the mother-daughter relationship has perhaps the most pronounced effect on how the pregnancy is resolved.

Pruksachan (1978) has discussed the impact of the history of the daughter's pregnancy on the family. He found that for three-fourths of the families he studied, this was the family's first acknowledgment of the daughter's sexuality. The reaction was often shock and disapproval. This contradicts the often held belief that early pregnancy and illegitimacy is an acceptable trend among black adolescents under slavery conditions. Plessner (1974)

complained that with her finding that teenagers as adolescents seldom  
early reported childbearing and the behavior of the daughter  
Bilman (1979) cited the fact that daughters whose mothers had  
early pregnancies were more likely to become pregnant as teenagers. (p. 129)  
As found in her earlier work, "female maternal behavior is apt to be  
overinfluential than paternal attitudes and goals for the (adolescent  
children of) children" (p. 128)

The influence of the family of origin on the prevention of  
pregnancy and the use of contraception and abortion has been another  
area of interest. In general, the authors have concluded that a young  
girl's attitudes both to human sexuality action and to use contraception  
are related to her parents' values and support of her, her relationship  
with each parent, and the degree of communication within the family  
(Miller and Jensen, 1981; Lewis, 1979). Fox (1979) cited the Lewis  
(1977) finding that, when adolescents consulted their families, the  
young women were more likely to continue the pregnancy and keep her  
baby. In contrast, those who sought abortions rarely consulted their  
parents.

The plans implemented by the young women following the  
decision to continue the pregnancy were discussed by Young, Mahan  
and Lohr (1978). In their study of the role of the mothers of young  
who carried their pregnancies to term, the authors was noted to be  
especially influential in the decision making process. The daughters  
(living arrangements, educational plans, and child care and childbearing  
arrangements were almost never affected by the mother.

We can look to the National Center for Health Statistics for a  
comprehensive summary of things the girls think during adolescence is  
needed to understand the trends. In comparing the birth rate of



relationship to that of older women, Fertility (FRN) has ~~been~~ <sup>been</sup> ~~high~~ <sup>high</sup> ~~in~~ <sup>in</sup> ~~the~~ <sup>the</sup> ~~1940s~~ <sup>1940s</sup> ~~for~~ <sup>for</sup> ~~15~~ <sup>and</sup> ~~and~~ <sup>and</sup> ~~16~~ <sup>and</sup> ~~year~~ <sup>and</sup> ~~old~~ <sup>old</sup> ~~and~~ <sup>old</sup> ~~older~~ <sup>older</sup> ~~women~~ <sup>women</sup>. These ~~have~~ <sup>have</sup> ~~increased~~ <sup>increased</sup> ~~during~~ <sup>during</sup> ~~the~~ <sup>the</sup> ~~1940's~~ <sup>and</sup> ~~and~~ <sup>and</sup> ~~has~~ <sup>has</sup> ~~declined~~ <sup>declined</sup> ~~steadily~~ <sup>steadily</sup> ~~since~~ <sup>since</sup> ~~that~~ <sup>that</sup> ~~time~~ <sup>time</sup>. The decline has been less extreme for 15-17 year olds. For the youngest women (15-16 years) the FRN rate has risen. The comparison of birth rates by race has revealed a striking pattern. Fertility rates (the birth and illegitimacy rates) are both higher for black than white teenagers. However, recent trends in birth and illegitimacy rates in the young reflect changes in the white population. The birth rate for black teenagers has declined steadily and the illegitimacy rate is fairly stable (Gutman, 1976).

A more recent survey from the Panel Study of National Longitudinal Mortality indicated a surprising trend in the fertility rate of young women below the age of 18. The fertility rate declined slightly for women under 18 (as did the) rates of intrauterine deaths among blacks and whites younger than 18 and among blacks aged 18-19 (Gutman, Changing Perspectives, 1976). While this most recent trend is encouraging, the fact remains that one of every five babies born today is born to an adolescent mother (Gutman, 1976).

The issue of child bearing and the relationship to child-rearing trends has been researched by the Alan Guttmacher Institute (1976). In 1971, of those adolescents who gave birth out-of-wedlock, 87 percent kept their babies, 10 percent gave the baby to live with family members or friends, and 3 percent gave the baby up for adoption. This large percentage of infants retained by very young parents has led to the study of the mother's ability to care for her baby and the consequences of such parenting on the baby's development.

The Transnational Relationship Between the Young Young Mother and her Mother

The research in this regarding the relationship between infant relationship is characterized by several characteristics. As we presented with previous is understanding the extent of the young family due to the fact that: (1) the transnational parents has been virtually unstudied, (2) there is an extremely high degree of controversy as the research related to adolescent pregnancy, and (3) when the relationship has been explored, the sampling has been such that no comparison to the "old age" mother has been made. Our discussion of the adolescent relationship relationship is thus limited. It is in this specific gap in our knowledge that the present study was designed.

As has been noted throughout this paper, one of the study was to address the questions regarding the behavioral implications of the young mother. An important aspect of early parenting has been the developmental tasks of adolescence which have largely in the transition to motherhood. Fox (1975) summarized the importance of several tasks related to parenting which were: (1) resolving feelings about the family of origin in order to separate and become autonomous, (2) an intense need for closeness and concurrent feelings of being "mothered", (3) coming to terms with the "role as if" question in defining one's self, and (4) the establishment of appropriate intimate bonds apart from the family. As has been discussed before, these are often overwhelming and have been noted to influence the young mother's relationship with her child. --

In a study of adolescent's expectations and attitudes towards their mothers, Feldman (1971) found disturbing characteristics of the young parents. He noted that to be an adolescent parent requires, essentially, emotional, intellectual and power to see physical problems

with their children" (p. 12). Williams also found young parents to have a lack of knowledge about child development and educational expectations of the infant. It was suggested that this lack of knowledge prevented the parents' access to the child and constituted a form of emotional abuse. These findings were based upon interviews conducted during home visits to the homes of 48 adolescent families residing in inner-city Philadelphia. The research group is cautious regarding their generalizability due to the lack of a comparison group of urban or white parents (Gibson, 1993).

The conclusions reached regarding young mothers' inappropriate attitudes and expectations towards her child were drawn from the perspective of its relationship to her hopes to become pregnant. In an age-specific sample of 488 urban women (15-45 years) Pearson (1991) found that almost half of all mothers between fifteen and nineteen years of age stated they had postponed their first birth. The mothers cited the reason that the infant "restricted their life choices for more than they had anticipated" (p. 18). The author concluded that early first births and resultant child care are in need of more in-depth communication in order to support their importance in the woman's development as a mother. Ryan (1991) supported this notion of the adolescents' having less "less than adequate in nurturing mothers" (p. 18-20), and concluded that the lack of knowledge and preparation for parenthood suggested a need for more appropriate interventions.

Gibson (1993) examined the lack of knowledge about infant nutrition that was hypothesized the mothers had. In prenatal and six months postnatal assessments of 128 mothers in the high-charge project, none evidenced a lack of knowledge about the infants' cognitive and socio-emotional development. The author noted that "Nutrition was seen as

maternal structure regarding little more than basic caregiving" (p. 44). The expectation of "too little -- too late" led to her conclusion that because young mothers are overwhelmed about what they need to give, they "are likely to view the gratifications able to be received from a baby" (p. 44). The results of this study provide valuable information regarding the educational needs of young mothers. Again, we are unable to ascertain whether or not this lack of knowledge is attributed to much due to the lack of a comparison group of older mothers.

The findings regarding the problematic nurturing style of the young mother have led to the often-unexamined conclusion that adolescents are likely to abuse and neglect their children to a significantly greater extent than the "of age" mothers. Spinale (1979) confirmed her findings of neglecting "too little, too late" with the child abuse literature regarding abuser's expectations of "too much, too soon". Collins (1980) noted the fact that most of the child abuse studies have found the father's involvement, and the age of the parent, to be significantly related to abuse.

Estabrook's (1978) most recent investigation into the predictions of pediatric social workers has illuminated the relative importance of the mother's age in predicting child abuse and delinquency. His findings from a study in Texas revealed the parent's social isolation to be the most significant predictor of frequency and in relative ranking is a four-item analysis which accounted for 40 percent of the variance among mothers and nonmothers, the mother found all measures of depression and isolation to be significant. No significant relations may not have due to mother's age. Immediate effects, which become or later long-term.

Intending this concept of the parent's *social responsibility* as the adolescent mother-infant relationship has proven to be illuminating. In a cross-national study of mothers and their newborns, Iruvainen and Lerner (1976) compared adolescent mother-infant dyads in Finland (close to them is the Soviet Union). Their findings revealed the importance of the extended family to be strongly related to both mother-infant closeness and the behavioral assessment of the newborn.

Perhaps the most in-depth studies of the importance of the extended family to the adolescent mother-infant relationship are those of Furstenberg (1974), Furstenberg and Greenlee, (1976). His longitudinal studies showed that most adolescent mothers were "apparently lacking responsibility, effective parents" (Furstenberg, 1976, p. 56) of young children, especially in the responsibilities of child care were shared by mother and father.

Furstenberg's most recent work explored the family's support in the early years of parenthood and its relationship to longitudinal assessments of childbearing outcomes and processes. At the five year follow-up of a sample of 486 mothers (Furstenberg, in press) in mothers' reports of self-confidence in ratings of parenthood information were rated using families of differing sociological support or children's characteristics. Among these mothers living alone or apart from the extended family, Furstenberg noted a higher level of control over the child's behavior and a higher level of interest in the child. The author concluded that the mother's ability to establish her own support system independent of the family was an important dimension of her parenting role (1978) and evidenced a willingness to take responsibility for herself and her child.

The impact of the maternal factor has yet to be explored with the wisdom of varying mothers' ages. This is especially important in view of the large extent of contemporary adolescent families. The most recent estimates reveal that 48 percent of the children whose mothers gave birth before the age of 18 experienced a family breakup by age 18' (Family Planning Perspectives, 1978, p. 118).  
Intervention With Young Mothers and Their Infants

In reflecting the relevance of early parenting with respect to the mother-infant relationship, we are confronted with demanding findings. Perhaps the most striking results, while due to method, have been the stratification of interventions designed to assist the young mother through her transition to parenthood.

In a smaller ( $N = 27$ ), quasi-experimental evaluation of the effects of weekly mother-infant classes in a pediatric clinic, Baker (1976) found significant gains in mothers' knowledge of infant development, institutional needs and infant health care. What promising were the significant increases in mothers' responsiveness to their infants and the infants' increased responsiveness to the mother. Baker noted that the program had a significantly stronger impact on the behavior of the youngest mothers.

In an observational and medical program for adolescents in London, Gaffey and Gaffey (1971, 1973) assessed the mother-child interaction only using 480 hours. The authors noted the young mother's speech, physical interaction and attentiveness to their infants as being a strong function of age while responsiveness was lower. They also found a major tendency to be a lack of verbal interaction. While

the study tested a comparison group of older mothers and adolescents who were given traditional treatment. The findings suggested important areas in need of intervention.

### Summary

Our review of information trends listed above suggest to their methodology, scope and the documented strengths and limitations of study printing. They do, however, provide an overriding basis for both future interventions and research designs. In summary, the conflicting results of studies investigating early printing are inconclusive. It is one question to investigate whether young parents are any different in their caregiving attitudes, feelings and behaviors than parents who have postponed childbearing. Granger (1977) synthesized the views of those who are more optimistic than the others:

By age 18 or so, most young people are at a higher level of development and integration, but need more time to assess their values, goals and interpersonal relationships. Young adults are regarded the ability to be matured to assume to carry a heavy load of responsibility, to control their impulses, to make wise judgments, and to be able to provide the child with a wealth of experience and firm guidance". In some subjects that younger adolescents might on the average, be as effective in their childbearing as older ones. It is more likely that, on the average, a potential pregnancy would particularly result a potential marriage.

On the other hand, 'ages and stages' are far from the whole story in human development and the readiness for parent-hood. People who have been 'well-adjusted' adolescents, whose individualities, talents, interests and experiences have particularly prepared them to come happily and effectively for children, may in special cases, regardless of their age, especially if various support systems are available to them to their own families and to the community (p. 161).

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\*To better speak, the use to and in all these changed (Granger, 1977, p. 161).

### The Outcome of Teen-Young Mothers: Barriers to High Future

Thus far, we have discussed early pregnancy and parenting from the perspective of the young mother. Of equal importance are the consequences of early childbearing and childrearing for the infants born to adolescents. Indirectly, we can guess that these infants are at high risk for medical, developmental, and educational problems. Several factors have been brought to our attention by Collier (1976) and Schultz et al. (1979) in their reviews of the risks associated with adolescent pregnancy. The increased obstetric and neonatal risk of pregnancy in a physiologically immature woman has been repeatedly documented to have long-range ramifications on the developmental outcomes of the infant (Knox and Heath, 1971). This is often complicated by delayed and inadequate prenatal care, poor individual status, maternal hyperactivity, social isolation and emotional stress (Schultz et al., 1979). As with much research on early parenting the investigation of the relationship between these factors and infant development have revealed inconsistent findings. They do, however, reflect inherent contradictions regarding the consequences of early pregnancy and childrearing for the infants of young mothers.

The most recent investigation of the prenatal, perinatal, and neonatal complications associated with adolescent pregnancy was discussed by Ryan and Schneider (1979) at the University of Tennessee Center for the Health Sciences. The authors studied the obstetric performance and the status of the infants at birth among a predominantly black sample of 111 teens who were 15 years of age or less at delivery. The findings revealed these patients to have high rates of inadequate prenatal care, prenatal complications and complications during labor and delivery. The perinatal death rate was found to be twice that of the general population.



The neonatal complications attributed by the upper uterus (17%), neonatal nervous system depression, pulmonary distension have been found to occur significantly more often in babies of subinocuous mothers. These findings offer important information as to considered in the treatment of the developmental status of anatomy of very young mothers. A methodological concern should be noted with regard to the mother's estimation of their sample's results to a previously unpopulated sample of older teens and "of age" mothers.

The findings as discussed above about neonatal risk and mortality of young young (16 weeks) adolescents, have been consistently documented throughout the electronic and pediatric research (Ginsbury et al., 1980; Collins, 1974; Jones and Placit, 1979; Kline, 1971, and Kefauver et al., 1979). Neonatal electronic complications of mothers under 16 years of age were found by Kline (1971). Very young adolescents were noted to have a significantly higher incidence of neonatal neonatal deaths, premature rupture of membranes and prolonged labor. Other electronic complications associated by Ginsbury et al. (1980) and Grier (1979). Distorted neonatal presentation and infections at delivery (Bridgman et al., 1980). Neonatal dyspnea and one day fever (Kline, 1971), and cephalopelvic disproportion (disproportion size of portion of the fetal head in relationship to the mother's pelvic structure) (Ginsbury et al., 1979). These problems have been related to the physiological and gynecological (the time span between the age of menarche and later pregnancy) immaturity of the mother (Collins and Kefauver, 1977; Kline, Kline and Kline, 1979).

The relationship between neonatal electronic complications and neonatal risk has been closely studied by several authors (Collins, 1974; McCandless et al., 1979; Rudolph, 1979; Kline and Kline, 1979).

Smith, 1976; Gross and Field, 1979; Sadey, 1974; Young et al 1977; Sennar, 1984). Findings which were consistently demonstrated by these authors indicated that the behavior of young mothers was at high risk for perinatal, neonatal, and infant mortality. Cohen (1978) cited a North Carolina study of perinatal mortality as an age specific sample which found that the mortality rate was highest when mothers were under 15, and declined through the age of 20.

The issue of malnutrition [impaired infant/infant development/development] was also found to increase significantly as the mother's age decreased. Weber's age and infant status to the neonate isolated malnutrition, diarrhea, epididymitis, fever, diarrhea with vomit, total duration with epilepsy (Kumar, 1979), low birth-weight associated with prematurity and low birthweight associated with small size for gestational age (Cohen, 1978).

In studies where a comparison group of "old age" mothers were included in the design, we are presented with different findings. Alexander and Kaplan's (1975) comparison of the National Collaborative Perinatal Study found to indicated no significant differences between mothers under 15 years of age and those over 20 with respect to perinatal death. Neonatal death was found to occur significantly more often when the mother was less than 15 years old. Their data did not support an association between out of wedlock births and perinatal risk. Gert and Ford (1984) concurred with the finding that the "major medical problems [of the adolescent] are controllable and do not differ appreciably from older women" (p. 144).

Kennedy et al. (1978) have summarized the limitations of studies which have reported the age of mother as a single predictor of maternal performance and neonatal status. The authors concluded

These studies must be read carefully as a result of differences in sample characteristics, the level of nutrition, and the immaturity of technology. The reader should be especially alert to any other studies that report about nutrient deficiencies in protein food, immaturity, very young girls, reports from their mothers or uncorroborated findings (Gawert, 1974). However, there appears to be more evidence in the literature that the young girl and her infant are high-risk children than in the proposition that they are not (p. 134).

When variables other than mother's age were analyzed as predictors of perinatal and neonatal status, the findings revealed no significant relationship to the age of the mother. The variables that were consistently noted to predict neonatal and neonatal outcomes were: 1) nutritional status of the mother; 2) socioeconomic status, 3) quantity of prenatal care, 4) parity (number of prior pregnancies), and 5) spacing of births (Haden et al., 1970; Haden, 1974; Levy and Levy, 1974; Hahn, Hahn and Levy, 1979; Haden et al., 1979). In total earlier by Levy and Levy (1974), many of the nutritional, economic and family planning problems of adolescents are 'interrelated,' but cannot become dependent upon the professional community's ability to solve these problems involved in young women and the women's reluctance to use them.

Dwyer's (1974) study of 251 11-15 year olds revealed in a pooled program found no significant relationship of anemia, weight, height and delivery complications. Her Dwyer notes no perinatal problems. Perinatal death did occur in 23 cases, however. While Dwyer's findings are promising and suggest the acceptability of the adolescent's potential resources, they are based on a study which failed to use a comparison group of older women or those with different personal care.

Samuels' (1974) study of 12,607 adolescents and teenagers in the 1961-1962 year in a U.S. Naval Hospital found socioeconomic status, 1974-1975. This year, medical status of age, 15 to 19, and

significant predictor of postnatal outcomes. The prematurity was not identical in the two groups. The only difference was the adolescent's higher incidence of prematurity (less than three hours) later and resistant fetal damage due to unattended deliveries.

The Collaborative Perinatal Study (Jell and Peck, 1970) revealed that younger adolescents were less likely to obtain prenatal services and that, when adequate prenatal care was given, the prenatal and neonatal death rates were significantly lower. The authors discussed the role of social and demographic variables in the outcomes of the infants of young women. In the discussion of the role of social and demographic variables in the outcomes of young women's infants, the authors concluded that "the burden of early maternal illness most heavily on the offspring. Infant mortality and morbidity are the greatest risks associated with 'early childbearing'" (p. 144).

In a report of the Collaborative Perinatal Study at Johns Hopkins Medical Center Study (Minkovitz et al., 1971) summarized the ramifications of prenatal and neonatal support to her statement:

The scope of child support is two dimensionally: 1) in terms of prenatal mortality, and 2) in terms of the postnatal impact, which while not sufficiently known to cause delay or abnormal death, results in long-term handicapping conditions of the surviving infant--for example, cerebral palsy, mental retardation, congenital malformation, blindness, deafness and other neurological deficits (p. 150).

This point was stressed as well by Jellison (1970). He reported Study's personal risk factors to conclude that "later fetal outcome and developmental performance are dependent upon the complex interaction of genetic, biological and environmental variables" (p. 157).

The relationship of maternal risk to the development of the infants of adolescent mothers has received relatively unqualified (Guttmacher Institute, 1976). There have been, however, a handful of longitudinal studies of children born to women enrolled in the Collaborative Perinatal Project (Kramer and Gordon, 1974). The follow-up assessments of these infants included the age of the mother at the birth and constitute our main sources of information regarding developmental outcomes of the children of young mothers.

#### Developmental Outcomes of Adolescent Pregnancy

The earliest and longest follow-up assessments of infants of adolescents were done as part of the Johns Hopkins Child Development Study sponsored by the Collaborative Perinatal Project. For this investigation, Hardy, Weiden, Stanley and Delvik (1973) defined adolescence as 15 years of age at time of delivery. The sample of 4,187 mother-infant dyads was selected at random in 1941 and followed at a time of 15-16 years and a 11 year period. The sample consisted of 764 mothers who were 17 years of age or less at delivery. In brief, there were no significant differences between the under 16 and over 16 groups in perinatal or infant death rates. All risk factors were significantly higher for infants than for whites.

At eight months of age, infants were assessed with the Bayley Scales of Infant Development. The infants of mothers 16-18 years of age obtained significantly higher scores on the mental scale than those of adolescents. Hardy concluded that this was suggestive of "more effective child-rearing practices" (p. 127). At four years of age, children were assessed using the Stanford-Binet Intelligence Test for Children, tests of fine and gross motor functioning, the Orthon-Barkley Speech Language Performance Test, a behavioral profile and psychological inventories. In all measures, a higher proportion of

children of adolescents with Down's have developmental outcomes. At seven years of age, the children of adolescent mothers performed less well than those of 20-29 year olds on the Bayley Scales Infant Scale for Children (BSIC), the Revised Stanford-Binet Test, and the Child Language Assessment Test (CLAT). The children of adolescent mothers were also found to have negative emotions related to academic achievement and rejection of school grades in the middle year assessment. Self-concept was measured by the Superiority and Pessimism Scale. No significant differences were found between the children of adolescents and those of older mothers.

Hardy et al. (1985) have provided an overview of scientific information regarding the long term effects of early malnutrition on the child. The negative developmental outcomes attributed to the top of the malnour are decreasing and suggest a need for early and intense interventions. A major limitation of this study is due to the lack of empirical evidence about the developmental processes of the mothers involved. Main other studies using Bayley measures at eight months have demonstrated that mental, language and cognitive development were significantly demonstrated to be correlated with mother-infant interaction. (Buckwalter, 1975; Buckwalter et al., 1975). The study of al (1975) study failed to assess the transaction process in a controlled situation.

Perrenburg (1976) used interviews, tests and observational data in a longitudinal study of low-income black adolescent mothers and their children. He found no differences on the Franklin Inventory in the three year old children of 17 year olds when they were compared to those of mothers of 24 and 29 years of age. He did find significantly higher scores using children raised by more than one adult. (Galligan

whose parents married early and whose children had the highest IQs.

In a five year follow-up, Finkelhor (1978) compared outcomes of young workers to children of older workers who were in parenthood. He found that children who were cared for by grandparents in the home scored significantly higher than those who were in parenthood. The author concluded that the child's cognitive ability was enhanced as a result of the role his mother learned from her parents which allowed her to become more educated and socioeconomically advanced. These findings point directly to the long term effects of the mother's social support system. The study is limited, however, due to small size of the sample and the lack of a comparison group of nonblack families.

Belbin (1979) studied the sociological, psychological, and language and behavioral outcomes of premature infants at three years of age. Her findings revealed that environmental and maternal variables contribute significantly to the prediction of developmental outcomes. Developmental variables investigated included mother's age, maternal education and amount of social stress. Follow-up measurements administered at three years revealed that the age of the mother did not contribute to the developmental success of three year olds.

Brown, Belsky and Beeghly (1985) studied a sample of 26,760 children born to mothers in the Baltimore/Washington Metropolitan Region. They tested the significance of 108 personal and developmental variables in order to determine their ability to predict intellectual performance at four years. Their findings revealed that maternal

education and intelligence (Horn) that might contribute to explained variance in prediction (p. 110) Horn. The age of the mother was not found to be a significant predictor. Bayley measurements at eight months were found to be predictive of delayed intellectual development in early childhood. These findings are particularly interesting in that they reflect the contributions of the mother's age to a mother, rather than age-specific sample.

In an age-specific study comparing children of mothers under 14 years ( $n = 44$ ) to those of age 14 and older ( $n = 80$ ), Lloyd and Baynes (1971) investigated parenting behavior, family composition, physical, social, and psychological characteristics. Subjects were matched on maternal status, Marfanage, parity and race. Data were collected at nine to eight and ten to twelve years using the Bayley and Stanley intelligence tests, the High Range Achievement Test, psychological observations and the Parental Bonding Instrument. At both eight and ten years children born to mothers under 14 years of age were at significantly greater risk on all measures. There was also a significant difference in the child's physical state, which revealed more children of young mothers to fall below the third percentile in height. They also displayed a trend towards lower weight' ( $p = .001$ ). No significant differences in intelligence or psychological adjustment were found. Children of adolescents were at a significantly lower reading level, however, and were found to be more dependent and less mobile. Younger mothers were noted to give more independence to the child, were less motherly, had less intimate maternal involvement with the child and were more likely to have intellectual interests. The conclusions reached by the



effects are based on thorough documentation. The use of a matched rather than random sample, however, has limited our understanding of the relative contributions of race, socioeconomic status and kindergarten. And these variables have controlled statistically rather than in the experimental design, the results could have been more generalizable. Another limitation of this study is the fact that the data were collected for a purpose other than that for which they were collected.

In summary, the long range outlook for the child born to a young mother appears quite dismal. Regardless of the methodology, almost every study has documented the intellectual, emotional, educational, developmental and medical risks associated with early pregnancy and parenting. Our only evidence of a more hopeful future for these children comes from these investigations into the role of the mother's support from her family and the professional community. Our knowledge today is lacking in both the content and scope of studies into the consequences of early parenting for the young mother and her child. It is in this specific gap in our knowledge that the present study was directed.

## CHAPTER III

### METHODOLOGY

The purpose of this study was to investigate the contributions of mother's age, perceived risk status, and socioenvironmental context and relationship necessary to the production of mother-infant transaction and the mental and psychomotor development of the infant. The population from which the sample was drawn consisted of mother-infant dyads who were served by the College of Medicine in the University of Florida. The subjects were recruited on the basis of the age of the mother and were recruited at Tuscan from the North leg to the Shands Teaching Hospital. Twenty-two mothers and their six-month old infants participated in the study.

The assessment procedures consisted of a six minute videotape of mother and infant in a free play situation and the administration of the Early Scales of Infant Development. Anthropometric and sociodemographic data were obtained from the Birth and Family Background Inventory which was designed for use in this study. Following the assessment, a parent and infant-oriented protocol was administered which was based on the infant's needs as outlined on the mental and psychomotor scales of the instrument. The data collection procedures were implemented at the Palmer-6, Clinic of Shands Teaching Hospital. The sample, design and the procedures, the data collection and analysis are described in this chapter.

As noted in Chapter I, the questions posed by the study were:

- (1) Do infant development and mother-infant transaction vary

as a function of the age of the mother?

- e) Is the relationship between mother's age and early diagnosis of transmission and infant development trends after controlling for mother's education, parity, income, ethnic origin, social support system, infant's sex and birth order and type of prenatal care?
- f) What is the nature of the relationship between prenatal medical care and development at six months after controlling for all independent variables?
- g) Which variables contribute predictive information to the identification of developmental delays in infant development measures at six months?
- h) Is there a positive association between the extent of prenatal and postpartum parenting substance and infant development at six months?
- i) Is there a positive relationship between the extent of the mother's social support system and transmission and the infant's development?

In keeping with the exploratory nature of this study, additional questions were investigated. The questions were:

- j) Is there a relationship between the age of the mother and infant development after controlling for transmission, infant's sex and birth order, prenatal and postnatal risk factors, ethnicity, parity, income, social support system and type of prenatal care and diagnosis?
- k) Are the transmissional behaviors of the mother-infant

relationship -- warmth, reciprocity, dependent involvement, negative affect and nonresponsive stimulation -- associated with the mental and psychomotor development of the infant while controlling for mother's age and education, infant's sex and birth order, parental risk status, family income, ethnicity, social support system and type of prenatal care and obstetric?

- 6) Is there a relationship between parental risk status and the mental and psychomotor development of the infant when controlling for the mother's age and education, the infant's sex and birth order, family income, ethnicity, social support system and type of prenatal care and obstetric?

### Definition of Terms

For the purpose of this study, the following definitions of terms were used:

- 1) Infant Development consisted of the composite specified by the Mental Development Index (MDI) and the Psychomotor Development Index (PDI) of the Bayley Scales of Infant Development. These indices reflect the mental, psychomotor, language and socio-emotional competencies of the infant.
- 2) Infant/Infant Interaction is the conceptual identification of behaviors described in the Infant Behavior Checklist. These behaviors were coded from videotaped transaction sequences.
- 3) Background/Response Behavior is that which is observed to be directly related to the behavior of another individual.
- 4) Nonresponsive Behavior is that behavior which is observed

to be HIV-infected and without regard to the behavior of another individual.

- (4) Infant-Infant Transaction refers to the infant exposures of heterosexual behaviors between males and infants.
- (5) Developmental Delay refers to a score of 84 or less on either the Mental or Psychomotor Development Index of the Infant Scale of Infant Development.
- (6) High Risk for Developmental delay refers to a score between 84 and 89 on either the Mental or Psychomotor Development Index of the Infant Scale of Infant Development.
- (7) At Risk for Developmental delay refers to a score between 81 and 84 on either the Mental or Psychomotor Development Index of the Infant Scale of Infant Development.
- (8) Exposed refers to Exposure Questionnaire refers to those patients who received statistical treatment from physicians in the Florida Diagnostic Clinic or Florida Teaching Hospital.
- (9) Public Health Department Exposed Case refers to those who received statistical care at a public health department clinic.
- (10) Infant-Infant Care Study Population involved patients in a 18 month area surrounding Jacksonville, Florida. These patients received prenatal and postpartum diagnosis, neonatal and pediatric care, family planning services, social services and nutritional counseling and optional prenatal diagnostic education (Johnson and Johnson, 1994: 8).
- (11) Diagnosis Population refers to patients who received prenatal and postpartum diagnosis neonatal and pediatric

care, family planning services, child care and nutritional counseling, a mandatory prenatal and childbirth education class and an optional infant, parenting and family development education class. This treatment was received by women who were 18 years of age and younger and who lived in a Park County area within the Mountain-Midway Care district (Moore, 1994, p. 1).

- 120 Shasta Teaching Hospital (S.T.H.) High Risk Group refers to women who are hospitalized for those women identified as having a high risk pregnancy. Obstetric and neonatal services were provided and an optional prenatal and childbirth education class was offered to these women.

### The Subjects

The population of interest in this study was that of nonbreastfeeding women residing in North Central Florida who were covered by the College of Medicine at the University of Florida, Gainesville, Florida. Using the birth log (a list of information pertinent to timing and delivery records) available through the Shasta Teaching Hospital, a stratified sample was drawn (Smith). Stratification was on the basis of mother's age (20, 24-25, 26-29, 30-34, 35 years). This method of sampling was used in order to ensure age specificity lacking in previous research.

This method produced an age-specific sample of birthing subjects who received the appropriate care, medical personnel and place (all, as outlined in Appendix A). Randomness and cultural representativity, while not specified, were additional products of the sampling procedure and were assumed in Table 3.

Of the 150 initial subjects, 11 participated in the study, complete data were obtained for 11 of these subjects. This attrition rate is comparable to that found by Kerkhof et al. (1977). The sample thus represents those subjects who were motivated to participate. Attrition was also due to other variables associated with poverty and/or early parental death as: 1) lack of transportation, 2) conflicting school and work schedules; 3) moving out of the state; and 4) giving the baby up for adoption. Many facilities provided as many as 150 calls to participants in the study.

During the course of the data collection process, the investigator questioned a number of subjects as to the reasons for participating or not participating in the study. Responses included: "I thought I was supposed to come!" "I wanted to see how my baby was doing -- if he was doing 'a' or 'b'." "He don't have a mother, and I wanted a pleasure." "I was worried about my baby's sex, legless." Negative responses included: "My baby's fine and I don't want you to tell me I'm severely depressed because I'm."

Further attempts were made to call each family for whom a phone number was located. In these telephone conversations, mothers refused to bring their babies to the clinic. There were private homes who were working in the Greenville area. A total of 40 families were reached by phone prior to their appointments. Of the families who agreed to come, only 11 did not participate (14 persons).

#### Procedure

All subjects in the sample were contacted by mail to notify them that their babies were scheduled for a six month developmental assessment.

In the Fellowship House. When the families -- often including brothers, friends and extended family members -- arrived at the clinic, a brief explanation of the procedures preceded the assessment. Subjects in the study were informed as to the nature of the developmental screening procedure employed and the purpose of the study. They signed a statement of informed assent, but were not told the variables under investigation in order to prevent bias during the data collection process (Appendix A). Treatment of participants was in accordance with the standards of the American Psychological Association and the Committee for the Protection of Human Subjects at the University of Florida.

Following an explanation of the procedures, the families were escorted to meet with the physician where a bag and tape were available for play. Subjects were encouraged to engage in a brief play period prior to the actual videotaped response. The videotaped segment was then recorded as the subjects participated in free play with their infants. The familiar play period and the videotaped play segment was designed to allow the baby to adjust to the environment. Each family was given the identical assessment of toys for the free play, which included rattles, balls, a mirror and a set of colorful blocks. Mothers were told that the purpose of the free play was: 1) to allow the baby to adjust; and 2) to get an idea of how the baby played in an unstructured stimulating situation with the parent.

Following the free play session, the mother engaged in a two to three minute warm-up play period with the baby before administering the Bayley Scales of Infant Development. The parent was informed as to the nature of each task and its purpose in the assessment throughout the



solidification of new values. After the evaluation, the needed support for the mental, psychomotor, language and socioemotional growth of the baby were discussed with the parent. Each request to age ranges in each area of development. Parents' questions were encouraged and answered were discussed during all phases of the assessment.

Following the assessment, the Infant-centered Information phase presented and focused on the specific strengths and weaknesses observed in the baby. Delays or problematic development was explained and appropriate practices for remediation were discussed. It was emphasized that many of these delays found at six months could be overcome in a short time with an additional source of stimulation and parent-child interaction. When applicable, developmental, nutritional and medical referrals were made to the appropriate agencies. In all cases, parents were also given a book of educational materials and a photograph of their baby to take with them.

Following the assessment, Infant and Family Development Specialists interviewed the mother to obtain demographic data. This was done in order to insure that the mother received advice on the age and prenatal care group of the mother.

#### Instrumentation

##### The Assessment of Infant Development

The Early Basis of Infant Development were shown as a direct measure of the infants' psychomotor and social abilities. The motor scale assessed adaptive and language behavior as evidenced in eye-hand coordination, posture sitting, exploratory and manipulative skills. Also included are linguistic vocalizations and the

complexities of communicating information. The scores were reduced from body control and locomotion and from motor coordination subdomains of the instrument were are adaptability to the testing situation and the availability of a neutral evaluator appropriate features of the test include the test materials, which were highly attractive to infants, and the administration of the test which allowed the infant to be held by the mother. Split-half reliability coefficients for the motor and mental scales of six months are reported as .88 and .80, respectively (Kaplan, 1980).

In their study of task-internal reliability (split-half method) Werner and Kaplan (1984) noted correlations between floor and ceiling assessments of mental and motor development to be .70 and .76, respectively. These assessments were also used again. Items involving emerging skills in social and interpersonal development and motor coordination were found to have a test-retest reliability of .76. This issue is especially important in a study of the month side as this is a critical time for the emergence of several new behaviors. It is therefore necessary to acknowledge when a baby's scores at six months could have greatly been due to day.

Inter-rater agreement is another aspect of reliability studied by Werner and Kaplan (1984). These coefficients were noted to be "markedly higher" than independent assessments did. The same instrument was scored by each observer. Inter-observer reliability was found to be .88 and .83 on mental and motor development, respectively. Examples of items in the scales can be found in Appendix C.

### Parental Risk Scale

In order to assess the parental risk level of pregnancy through first month of child risk status of the infant at birth, the Parental and Temperament Risk Scale (Bates et al., 1978) was adapted for use in this retrospective design. This instrument was developed as a system for the prospective analysis of parental traits and various various components in parental (maternal), labor and delivery and neonatal (neonatal) characteristics (see Appendix B). Information regarding the risk status of the parents was obtained from the infant's medical records.

### Underlying Transaction

The systematic observation of the transaction process has become a meaningful way to investigate behavioral components of the parent-infant relationship.

In order to observe parenting behaviors, a low-inference observation system was used. The measurement of maternal-infant interaction was based on the assumption that reciprocal/contingent behavior can be measured through the use of the Behavioral Interaction Scale. This scale was previously used by Belsky (1974) and Belsky (1979) to analyze parent-infant transactions in the specific studies of one, three, six and eight month old infants and their mothers.

The Behavioral Interaction Scale consists of 11 behavioral categories each of which is assigned individually to parent or infant behavior. The behavioral categories of the instrument were selected for their appropriate record of "parenting ability" which have consistently

constituted a strong relationship to infant development and were the focal point of this study:

- 1) The asymmetrical expression of affect (both positive and negative);
- 2) The ability of the parent to become so tuned personally to the actual state of the infant as varied levels of cognitive and emotional development;
- 3) The ability of the parent to interact with the child in a manner which is responsive to the actual state of the child as observed and interpreted over time.

The interactions and their descriptions are presented in Appendix E. Because of the highly sensitive and potentially ambiguous nature of the transmission process, it was necessary to join the use of the behavioral coding the experimenter's initial under investigation and double experimenter estimates of behavioral reliability. A reliability study was previously implemented with fidelity by creating a Parent-Parent Recall Correlation as independent ratings of two observers. In 10 behavioral categories, the scores were found to have a mean agreement of  $r = .83$  (Goodrich, 1981; Goodrich et al., 1984). Similar interobserver remarks have been found to have predictive validity from observational records to this method in Bayley mental scores at one year (Garvin, Rose and Jostes, 1979; Long, 1979). These studies assessed transmission among dyads of varied age, socioeconomic status and ethnic/race status.

The decision was made to adopt the Bayley Infant Behavior Scale for use in this study based on current theoretical and practical

aspects of mother-infant transaction. The instrument was originally constructed for observations of infants and mothers in the home. Certain variables (such as Green's function and mother gaze during feeding) were not applicable to this hospitalization. Further, cases which influenced the adaptation was that the male was constructed and implemented with positive infants and their caregivers at two, three and eight months of age and adapted by Greenman (1976) for six and eight months of age. These considerations were of importance in this study and were the basis upon which some original variables were constructed with variables which were more applicable to the structured playroom setting as a study of six month olds.

The coding of the videotapes was also adapted so that (a) behavior was coded every four seconds or when the behavior changed rather than every 10 seconds as originally implemented. The rationale for this adaptation was based on the dynamic characteristics of mother-infant transaction which necessitated the more precise analysis of the process as behavior occurs in a flow (rather than in) coded time span.

#### Interobserver agreement

The issue of reliability--the extent to which measures of behavior are measured consistently--has been a subject of great concern. This concept is first clarified by Greenberg and Saperstein (1965) in their statement: "An investigator asks those the precision or consistency of a measure because he wishes to generalize from the observation as based in some class of observations to which it belongs." (p. 100)

The two observers were selected on the basis of their prior experience in coding parent-child interactions videotapes. In another study (Spicer, 1970) these observers evidenced skills in coding observable behaviors of subjects and their pressure systems and were found to be consistent in their ratings.

Training of the coders involved detailed explanations and numerous examples of each behavioral category. The observers were entered initially and at randomly determined periods throughout the coding process in order to maintain the system in which behaviors were rated consistently. Portions of the videotapes were coded by both coders. This permitted the assessment of intercoder reliability. Table 1 presents the Pearson Product-Moment correlations between the frequencies reported by the two coders.

In order to reduce the number of variables to be used in subsequent analyses and to represent more global dimensions of mother-child interactions, a correlation matrix of descriptive measures was subjected to a Principal-Component analysis using the varimax rotation. The results of these analyses are discussed in detail in Chapter IV.

#### Statistical Analysis

The variables under investigation in the study were the age of the mother, the education of the mother, the sex and birth order of the infant, parental risk status, yearly income, ethnic origin and type of prenatal care. The analyses were designed to assess the contribution of these variables to the prediction of

Table 1  
 Inter-Observer Reliability of  
 Written In-Pop Transcriptions of Interactions

Interaction	N	Observer	r <sup>2</sup>
<u>Subject Interactions</u>			
Comments	88	Subject responses	.81
Comments	78	Subject Partners	.748
Questions	88	<u>Subject's Response</u>	
Nonverbal Aid	87	Subject's Positive Response	.87
Following Interacts	72	Subject's Negative Response	-.77
Aggressive Nonverbal Aid	88	Subject's Disruptive Non- verbal Interaction	.87
Proactive Aids	1,00	Face to Face Orientation	.88
Affirmative Verbal	88	Subject's Ignoring Response	.81
Interfering Verbal	88	Subject's Disruptive Response	-.88
Aggressive Substitutions	1,00	Subject's Negative Response	-.77
		Subject's Disruptive Verbal Interaction	-.77
<u>Adult Interactions</u>			
Aid to Caregiver	88	Partner's Aid	-.77
Teaches	88	Subject's Ignoring Response	-.81
Verbal Response	88		

\*\*\*The correlation coefficient, not at least ratings evidenced as reliability

Table 1  
Mean and Standard Deviations  
for Individual Behavior Variables

Variable	Mean	SD
Control	1.4134	1.1343
Compliance	1.044	1.0471
Conformity	.6132	1.0131
Reinforced Altruism	1.1042	1.0129
Increasing Altruism	21.4447	8.1474
Repetitive Reinforced Altruism	.6131	.9132
Reactive Altruism	.6071	1.004
Offenders' Trust	1.1033	1.0237
Interfering Trust	1.0744	1.1092
Repetitive Verbalizations	.1248	.6248
Not to Obey/Disobey	.6077	1.1094
Not to Transgress	1.1629	1.0997
Not to Defect	.9497	1.0997
Self-Blame/Altruism	.6126	.1132
Reactive Altruism	.6126	.1172
Not to Regress	19.1042	8.2492
Not to Punish	1.0779	1.1129
Not to Punish: Response	4.1049	1.0091
Not to Regress: Response	.1044	.9119
Not to Regress: Transgressions	1.1039	1.0277
Not to Regress: Response	1.0411	1.0077



Table 3 (Cont.)

Variable	Mean	SD
Doctor's Ignoring Response	7664	2 4368
Doctor's Positive Response	12 1408	4 4943
Doctor's Negative Response	14000	8778
Doctor's Conditional Recommendation	17178	3 2707
Medical Costs	18943	2348
Doctor's Ignoring Response	2 7683	2 4548

mother-infant transaction and infant development as outcome measures of early pregnancy and parenting.

In order to reduce the number of variables and represent the core stated dimensions of mother-infant transaction, a subsequent analysis, a correlation matrix of the 11 behavioral categories was subjected to a Principle Components analysis. As a result of this analysis, five dimensions of mother-infant transaction were defined and each subject's (complete response) component score was calculated for each of the five components. These calculations were based on the addition of the total number of behaviors which had a positive loading on the component and the subtraction of the number of behaviors which had negative loadings on the component. The reliability of the dimension was computed on each of the five components using a Pearson Product-Moment Correlation procedure. These analyses were assessed using the Statistical Package for the Social Sciences (SPSS) (Nie et al., 1975).

In the second multivariate multiple regression analysis, the dimensions of mother-infant transaction and the infant's mental and psychosocial development were considered to be the outcome measures of early pregnancy and parenting. These measures were therefore treated as dependent variables and were expressed as mother's age and education, baby's sex and birth order, family income, ethnic origin, social support system, personal risk status, and type of prenatal care.

The second multivariate multiple regression analysis addressed the question regarding the ability of the transaction components to

predict the mental and psychomotor development of the infant. In this analysis, mental and psychomotor development were expressed as mother's age and education, baby's sex and birth order, ethnic origin, parity history, social support system, personal risk factors, type of prenatal care and the four dimensions of mother-infant transaction. The multivariate multiple regression analyses were executed using the General Linear Model program of the Statistical Analysis System (SAS) (Barr et al., 1976).

### Limitations of the Study

The use of videotape analysis in a low-income environment seemed to maximize interaction between individuals. In addition to the limitations imposed by the fact that the behavior observed is that which the study subject is willing to express in the given situation, there appears to be confounded as well by the researchers' field status and social setting, thus when previous history in the mother and that affects infant behavior. In an attempt to alleviate possible biases in the assessment environment, the "playroom" setting was simulated in the Pediatric Clinic.

The purpose of an evaluation of infant development at one month of age is to establish a baseline for use in diagnosis and prescriptive protocols regarding the infant's strengths and limitations. While the information obtained is useful for the identification of competence and delay, the scales are unable to predict future development.

Another limitation is the fact that the families studied were those who responded to the request and were motivated to participate

in the study. These subjects also were contacted, but did not participate because they differ systematically from those who participated.

A final limitation placed on the study is the ex-post-facto or correlational nature of its design. While correlations and relationships among the variables can provide useful information, no inference of causality can be interpreted from the results of the study.

### Summary

In summary, the data were collected and analyzed in order to assess the behavioral dimensions of adolescent transaction and the social and personality development of the factors in an age-specific sample. In addition, the study was designed to explore the mother's age, social support system, parental risk status, parental mental state, and participation in childbirth and parenting education programs in order to assess their contributions to the prediction of transaction and development of adolescents. The results of the analyses are presented and discussed in Chapter IV.

## CHAPTER IV

### RESULTS

The purpose of this study was exploratory in nature and was based on the fact that relatively little is known about the developmental outcomes of very young children and their infants. The analyses were implemented in order to ascertain the contributions of the mother's age, social support system, personal risk status, type of prenatal care, type of prenatal childbirth education and type of parenting education as they related to mothers' transactions with their infants and the infants' development. The questions addressed in this study and the analyses are discussed in this chapter.

#### The Dimensions of Parent-Infant Transactions

Before proceeding to the analyses which addressed the major questions posed by the study, the dimensions of mother-infant transactions were studied. The number of behaviors in each category of the Infant Behavior Scale were first tallied for each subject. A correlation matrix of the variables was then subjected to a principal components analysis.

The analysis yielded eleven components with eigenvalues greater than 1.0. These components accounted for 84 percent of the variance. The components corresponding to the five longest eigenvalues were treated using the Varimax procedure. The five related components,

adjusted on a number of the subjects. Table 3 reports the loadings of the variables on each component. Table 4 reports the factor score coefficients of the variables.

The results of the Principal Component analysis were used to guide the formation of the subjects' composite scores on each of the five components. Variables were included in those scores such that those with factor score coefficients greater than .25 defined the component. In the fifth component mother's negative responses were included in the composite component score based upon observed interpretations of the observed behavior of the mother-infant transaction process. The total number of behaviors per behavior with positive coefficients were added to calculate each component score. The behaviors which had negative coefficients were subtracted from this sum. This process often resulted in the composite scores of a subject on a component being less than or equal to zero. The following formulas were used to calculate the component scores on each of the five components:

Component Score 1 (Stimuli) = Attentional Transfer +

Infant + Post Infant Interaction

Component Score 2 (Responsivity) = Baby's Affective Response +

Mother's Positive Response + Initiating Talk +

Baby's Exploratory Behavior

Component Score 3 (Responsive Recalibration) = Baby's Vocal

actions + Mother's Recalibrating Recalibration +

Baby's Recalibrating Recalibration + Mother's

Recalibrating State

Table 4

Bivariate Factor Correlations of Subject-Related Instruments

Variable	Component 1 Burdens	Component 2 Inequity	Component 3 Subjective Burden (ASB)	Component 4 Subjective Burden (BSB)
Gender	.147	-.049	-.023	.148
Ethnicity	.047	.040	.011	-.063
Education	.001	-.006	.046	.040
Employed (Yes)	-.007	-.128	-.279	-.001
Insurance Status	-.005	.045	.000	.103
Subjective Perceived Stigma	-.000	-.175	-.001	-.046
Depressive Symptom	.073	-.067	.000	-.006
Subjective Health	.041	.046	-.011	-.123
Loneliness (Yes)	.000	-.110	.000	.063
Subjective Vulnerability	.108	.003	-.000	.001
Older in Community	-.146	-.067	-.000	.060
Perceived Stress	.003	-.000	.041	-.011
Health at Baseline	.000	-.000	.011	-.000

Table 4—continued

Self-insulation	500	500	500	500	500	500
Energy subsidy	500	500	500	500	500	500
Private	500	500	500	500	500	500
Public	500	500	500	500	500	500
Industry's Positive Response	500	500	500	500	500	500
Industry's Negative Response	500	500	500	500	500	500
Consumers' Positive Response	500	500	500	500	500	500
Consumers' Negative Response	500	500	500	500	500	500
Price to Firm Subsidization	500	500	500	500	500	500
Industry's Spending	500	500	500	500	500	500
Industry's Production Response	500	500	500	500	500	500
Industry's Negative Response	500	500	500	500	500	500
Consumers' Subsidization	500	500	500	500	500	500
Industry's Cost	500	500	500	500	500	500
Industry's Spending	500	500	500	500	500	500
Total Amount of Incentive	12,500	12,500	12,500	12,500	12,500	12,500





TABLE 1. E-continued

Self-employment	2,012	- 200	- 200	1,612	- 200
Government	2,120	1,140	2,000	1,160	2,120
Partners	- 2,000	- 1,110	2,000	2,000	2,000
Private	2,000	- 2,000	2,000	- 2,000	- 2,000
Individuals (Positive Response)	- 1,000	1,000	1,000	- 1,000	- 1,000
Individuals (Negative Response)	- 1,000	- 1,000	- 1,000	1,000	1,000
Employment (Positive Response)	1,000	- 1,000	1,000	- 1,000	- 1,000
Employment (Negative Response)	1,000	- 1,000	1,000	- 1,000	- 1,000
Partners (Positive Response)	2,000	- 1,110	2,000	2,000	2,000
Partners (Negative Response)	- 2,000	- 1,110	2,000	- 2,000	- 2,000
Individuals (Positive Response)	2,000	- 1,110	2,000	2,000	2,000
Individuals (Negative Response)	- 2,000	- 1,110	2,000	- 2,000	- 2,000
Employment (Positive Response)	2,000	- 1,110	2,000	2,000	2,000
Employment (Negative Response)	- 2,000	- 1,110	2,000	- 2,000	- 2,000
Total (Positive Response)	10,000	10,000	10,000	10,000	10,000
Total (Negative Response)	- 10,000	- 10,000	- 10,000	- 10,000	- 10,000
Total	0	0	0	0	0
Total (Positive Response)	10,000	10,000	10,000	10,000	10,000
Total (Negative Response)	- 10,000	- 10,000	- 10,000	- 10,000	- 10,000
Total	0	0	0	0	0

$$\begin{aligned}
 \text{Component Score 2 (Negative Affect)} &= \text{Mother's Commands} + \\
 &\quad \text{Mother's Criticisms} + \text{Mother's Interfering} \\
 &\quad \text{Teacher} + \text{Jody's Negative Responses} \\
 \text{Component Score 3 (Inappropriate Reactions)} &= \text{Mother's} \\
 &\quad \text{Excessive Nurture} + \text{Mother's Overindulging Teacher} + \\
 &\quad \text{Jody's Ignoring Responses} + \text{Mutual Gaze} + \\
 &\quad \text{Mother's Negative Responses}
 \end{aligned}$$

A Pearson Product-Moment Correlation procedure between the frequencies of the original variables and the component scores was implemented. The correlation coefficients are reported in Table 1 and indicated that the individual variables chosen to compose the component scores are highly correlated with the new components. It was indicated that the variables which should not be correlated with the components were not. These correlations supported the interpretation of the composition of variables selected to define the dimensions of mother-child transactions.

The matrix found small that 11 of the relationships were noted by two scores. This permitted the comparison of the component scores for each component of mother-child transaction and the assessment of interobserver reliability for the comparison. The Pearson Product-Moment Correlations between each pair of component scores are reported in Table 2. The results of this analysis indicated that the two observers were consistent in the coding of the five dimensions of the transaction process.





Table 4

**Manufacturers' Liability of  
Retail-School Termination Agreements**

Component	Cost
Recall	\$1
Reciprocity	\$20
Reputation Penetration	\$13
Regulatory Affairs	\$80
Reimbursement Guaranteeing	\$0

### Description of the Sample

Descriptive statistics and a correlation matrix of the independent and dependent variables were calculated for the sample of 77 mother-infant dyads. Frequency distributions were calculated for the independent and dependent variables and are reported in Tables 1, 2 and 3. The mean and standard deviation of the dependent variables are presented in Table 1b.

An inspection of all the distributions of the measures of potential risk indicated that the majority of the sample was within normal limits on birth. The mean and frequency distributions for the measures of infant's mental and psychomotor development indicated that the entire sample was within normal limits of development at six months of age. The mean of the sample was consistently higher than those reported in the Bayley Scales of Infant Development Manual (Bayley, 1948). The standard deviations of the sample are equivalent to those reported in the manual. An interpretation of these findings is discussed in Chapter 7.

Interscorer reliability was then computed by means of a Pearson-Product Moment Correlation on the paired dependent scores. The results of this analysis are presented in Table 4. The purpose of the measures of interscorer reliability was to measure the extent to which the two independent observations of behavior were consistent. From the results of this analysis it can be seen that the measures of reliability are consistently across measures.

Table 3

Frequency Distributions for Several Independent Variables

Variable	Frequency	Percentage	Frequency
<u>Subject's Age</u>			<u>Subject's Sex</u>
< 18	5	Male	48
18-19	21	Female	37
20-29	11	<u>Subject's Ethnic Origin</u>	
30-39	19	Lat. Amer.	34
40-49	21	Eng. Amer.	17
50-59		His. Amer.	5
60-69	42	W. Amer.	5
70-79	33	<u>Subject's Income</u>	
<u>Subject's Sex</u>		< \$1,000	19
Female	36	\$1,000 - \$1,999	18
Male	39	\$2,000 - \$29,999	21
<u>Subject's Marital Status</u>		\$30,000 - \$99,999	15
Married	44	\$100,000 - \$199,999	1
Single	9	> \$200,000	
Divorced	11	<u>Subject's Employment Status</u>	
<u>Subject's Education</u>		0 Years, none-yr. coll.	1
< 12 years	43	1 Years, 1-year coll.	30
12-14 years	21	2 Years, 2 years coll.	30
15-16 years	9	3 Years, 3 years coll.	1
<u>Subject's Employment Status</u>		4 Years, 4 years coll.	
Employed	33	<u>Subject's Health Status</u>	
Unemployed	28	< 20 Months	27
<u>Subject's Health Status</u>		21 - 30 Months	20
< 20 Months	27	31 - 40 Months	11
21 - 30 Months	20	> 40 Months	2
31 - 40 Months	11		
> 40 Months	2		



Table 1

Frequency Distributions for  
Relative Injury Frequency

Frequency	Frequency
<u>Normal</u>	
0 - 10	10
10 - 20	1
20 - 30	1
<u>Underwater</u>	
0 - 10	10
1 - 20	10
20 - 30	11
<u>Regenerative Toxicology</u>	
0 - 10	6
10 - 20	10
1 - 30	13
20 - 30	3
<u>Regenerative Alcohol</u>	
0 - 4	10
1 - 10	10
10 - 20	6
<u>Regenerative Alcohol</u>	
0 - 4	10
1 - 10	10
10 - 20	10
20 - 30	1

Table 1  
Frequency Distributions for  
Infant Development Variables

Variable	Frequency
<u>Bayley Index of Infant Development</u>	
<u>Normal Development Index</u>	
< 40	0
40 - 50	0
50 - 60	0
60 - 70	1
70 - 80	1
80 - 90	1
90 - 100	1
100+	0
<u>Chronological Development Index</u>	
< 40	0
40 - 50	0
50 - 60	0
60 - 70	1
70 - 80	1
80 - 90	1
90 - 100	1
100+	0

Table 18

Means and Standard Deviations for Scores  
on the Bayley Scale of Infant  
Development, and the Stanford-Binet Scale

Variable	N	Mean	SD
<u>Bayley Scale of Infant Development</u>			
Bayley Mental Index	77	122.28	18.28
Bayley Psychomotor Index	77	117.44	17.62
<u>Composite Stanford-Binet Scale</u>			
Verbal	77	8.28	4.64
Nonverbal	77	12.06	10.13
Nonverbal Prejudication	77	4.47	4.24
Psychotic Index	77	3.71	4.38
Nonverbal Prejudication	77	6.33	3.84

An initial examination of the cross tabulations revealed the type of program used to be highly correlated with the type of prenatal diagnosis and postpartum parenting education received by the mother. The type of prenatal care received by the mother accounted to a great extent the type of educational program she was offered. As a result, prenatal diagnosis education and parenting education were omitted from further analysis. The variable types of prenatal care<sup>1</sup> correlated more infrequently due to the differences in prenatal and parenting education programs offered in conjunction with prenatal medical care. The cross tabulations are presented in Table 11.

The correlation matrix is presented in Table 12 and indicated that the potential risk status of the mother and infant were not correlated with the presence or absence of prenatal complications. Complications found among women in this sample included anemia, toxemia, venereal disease and infection. The fact that these risk factors were uncorrelated was not expected due to the fact that the measure of potential risk included prenatal complications. It is possible, however, that the coding system employed by the study is not useful for studies which are retrospective in nature. Another possible interpretation is that the study may not be sensitive to the importance

Table 10

Costs, Utilization of, Type of, Preschool, Grades,  
Elementary, Secondary, Education and Postsecondary Education

Type of Educational Costs	Elementary, Out-of-School Education				Postsecondary Education			
	Average Presidency Year	Elementary Costs Preschool	Elementary Costs Grades 1-12	Elementary Costs Grades 13-16	Average Presidency Year	Postsecondary Costs Undergraduate Education	Postsecondary Costs Graduate Education	Postsecondary Costs Doctoral Education
Elementary Education - 19			1	1		1	1	1
Elementary Education - 20			1	1		1	1	1
Elementary Education - 21			1	1		1	1	1
Elementary Education - 22			1	1		1	1	1
Elementary Education - 23			1	1		1	1	1
Elementary Education - 24			1	1		1	1	1
Elementary Education - 25			1	1		1	1	1
Elementary Education - 26			1	1		1	1	1
Elementary Education - 27			1	1		1	1	1
Elementary Education - 28			1	1		1	1	1
Elementary Education - 29			1	1		1	1	1
Elementary Education - 30			1	1		1	1	1
Elementary Education - 31			1	1		1	1	1
Elementary Education - 32			1	1		1	1	1
Elementary Education - 33			1	1		1	1	1
Elementary Education - 34			1	1		1	1	1
Elementary Education - 35			1	1		1	1	1
Elementary Education - 36			1	1		1	1	1
Elementary Education - 37			1	1		1	1	1
Elementary Education - 38			1	1		1	1	1
Elementary Education - 39			1	1		1	1	1
Elementary Education - 40			1	1		1	1	1
Elementary Education - 41			1	1		1	1	1
Elementary Education - 42			1	1		1	1	1
Elementary Education - 43			1	1		1	1	1
Elementary Education - 44			1	1		1	1	1
Elementary Education - 45			1	1		1	1	1
Elementary Education - 46			1	1		1	1	1
Elementary Education - 47			1	1		1	1	1
Elementary Education - 48			1	1		1	1	1
Elementary Education - 49			1	1		1	1	1
Elementary Education - 50			1	1		1	1	1
Elementary Education - 51			1	1		1	1	1
Elementary Education - 52			1	1		1	1	1
Elementary Education - 53			1	1		1	1	1
Elementary Education - 54			1	1		1	1	1
Elementary Education - 55			1	1		1	1	1
Elementary Education - 56			1	1		1	1	1
Elementary Education - 57			1	1		1	1	1
Elementary Education - 58			1	1		1	1	1
Elementary Education - 59			1	1		1	1	1
Elementary Education - 60			1	1		1	1	1
Elementary Education - 61			1	1		1	1	1
Elementary Education - 62			1	1		1	1	1
Elementary Education - 63			1	1		1	1	1
Elementary Education - 64			1	1		1	1	1
Elementary Education - 65			1	1		1	1	1
Elementary Education - 66			1	1		1	1	1
Elementary Education - 67			1	1		1	1	1
Elementary Education - 68			1	1		1	1	1
Elementary Education - 69			1	1		1	1	1
Elementary Education - 70			1	1		1	1	1
Elementary Education - 71			1	1		1	1	1
Elementary Education - 72			1	1		1	1	1
Elementary Education - 73			1	1		1	1	1
Elementary Education - 74			1	1		1	1	1
Elementary Education - 75			1	1		1	1	1
Elementary Education - 76			1	1		1	1	1
Elementary Education - 77			1	1		1	1	1
Elementary Education - 78			1	1		1	1	1
Elementary Education - 79			1	1		1	1	1
Elementary Education - 80			1	1		1	1	1
Elementary Education - 81			1	1		1	1	1
Elementary Education - 82			1	1		1	1	1
Elementary Education - 83			1	1		1	1	1
Elementary Education - 84			1	1		1	1	1
Elementary Education - 85			1	1		1	1	1
Elementary Education - 86			1	1		1	1	1
Elementary Education - 87			1	1		1	1	1
Elementary Education - 88			1	1		1	1	1
Elementary Education - 89			1	1		1	1	1
Elementary Education - 90			1	1		1	1	1
Elementary Education - 91			1	1		1	1	1
Elementary Education - 92			1	1		1	1	1
Elementary Education - 93			1	1		1	1	1
Elementary Education - 94			1	1		1	1	1
Elementary Education - 95			1	1		1	1	1
Elementary Education - 96			1	1		1	1	1
Elementary Education - 97			1	1		1	1	1
Elementary Education - 98			1	1		1	1	1
Elementary Education - 99			1	1		1	1	1
Elementary Education - 100			1	1		1	1	1

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Washington, University of Washington, Seattle, WA, 1994

### Conclusions: Effects of the Interventions and Community Participation

[illegible]

Table 21---continued

21) Aggregate Variations	61	7
22) Negative Effect	1 00	30
23) Nonnegative Dislocation		1 00

of the very prenatal complications present in subsequent children) as a result, the presence or absence of prenatal complications was included in subsequent analysis.

The Determination of Mother's Age, Perinatal Risk Status and  
Prenatal Complications, Delivery and Neonatal Complications  
in Neonatal Transition and Infant Development

In keeping with the exploratory purpose of the study, much was to derive information regarding the outcomes of early pregnancy and parenting, a number of hypotheses were tested. For multivariate analysis were implemented which involved several multiple regression procedures. These analyses, which addressed the ability of the independent variables to predict mother-infant transition and infant development, were subjected to a conservative critical value in each association and multicollinearity test of significance. The significance alpha was set at .01 for the multicollinearity tests. Using the Bonferroni approach, this was divided by the total number of dependent variables such that the criterion for significance was dependent upon the hypothesis being tested. In each subsequent follow-up analysis, the criterion for significance was set at .01 Waller's age as a Predictor of Transition and Development

The questions of interest important to this study concerned 1) the ability of the very young mother to facilitate positive transition with her baby, and 2) the developmental status of the infants of young mothers. This led to the questions regarding the nature of the relationship between mother's age and transition and development. The specific questions mirrored in the first



# Analysis aims

- Question One: Is infant development and mother infant interaction  
 any as a function of the age of the mother?
- Question Two: Is the relationship between mother's age and each  
 dimension of interaction and infant development  
 linear after controlling for all independent  
 variables?

To test the hypothesis that there would be no relationship between  
 mother's age and interaction and development, a multivariate multiple  
 regression analysis was used. In this analysis, the dependent measures  
 were mother development, professional development, warmth, sensitivity,  
 responsive communication, maternal affect and mother-infant interaction.  
 The independent variables were mother's age and education, baby's sex  
 and birth order, infant weight, family income, social support system,  
 parental compliance, parental risk status and type of parental care.

The results of the univariate tests of the contribution of each  
 dependent variable to overall prediction indicated that only social  
 development was significant. The results are presented in Table 10. A  
 visual inspection of the plot of the residuals against the predicted  
 values of social development revealed that the data met the assumption  
 of homoskedasticity (homogeneous error variance around the regression  
 line) and was appropriate for the analysis.

The tests of significance of the independent main effects (Table  
 10) indicated that the age of the mother did not contribute to the overall  
 prediction of mother infant interaction and infant development (or IQ),  
 but did contribute to the prediction of the infant's social development.

Table 11

Results of the Hierarchical Tests of the Contributions of General Equilibrium Variables to Human Capital Formation and Human Development

Dependent Variable	h	h'
Human Development	.16	.009
Population Development	.17	.06
Health	.18	.11
Employment	.19	.11
Employment Participation	.14	.08
Regional Effect	.07	.09
Nonresponse (Missingness)	.13	.08

Table 11

Results of the Multivariate Significance  
Tests of Contributions to Mother Infant  
Interaction and Infant Development

Variable	F <sup>a</sup>	df	p
Mother's Age	1.48	1, 67	.18
Infant's Birth Order	1.07	1, 67	.31
Infant's Sex	2.08	1, 67	.16
Infant's Weight	1.28	1, 67	.27
Maternal Support Index	.04	1, 67	.84
Mother's Education	.91	2, 67	.41
Family Income	6.83	1, 67	.01
Type of Prenatal Care	1.48	28, 268	.10
Prenatal Complications	1.07	1, 67	.31
Prenatal Risk	1.11	1, 67	.30

<sup>a</sup>Transformation of Mother's Education to an F statistic

conclusion). The results of cluster analysis did not support the hypothesis that the psychomotor development of the infant and the mother-infant transaction process varied as a function of the age of the mother. The results of the multivariate analysis are presented in Tables 14 and 15.

The preceding multivariate multiple regression analysis was also designed to answer additional questions posed in the study:

**Question Four:** Is there a positive relationship between the extent of prenatal care, prenatal and postpartum nursing education and infant development and mother-infant transaction in this mother?

**Question Five:** Is there a positive relationship between the mother's social support system and transaction and the infant's development?

The analysis of the multivariate main effects (Table 14) revealed that the presence of prenatal complications and the type of prenatal care received by the mother were related significantly to the prediction of infant development. The type of prenatal care accounted for 6 percent of the variance in infant development. The follow-up analysis of the pairwise comparisons of each type of prenatal care indicated significantly higher mean for infants whose mothers received teenage pregnancy. These were then compared to those receiving treatment by a pediatric physician and Family Teaching Hospital, High Risk Clinics. The results of the pairwise comparisons and the adjusted mean for each prenatal care group are presented in Tables 17 and 18. In total control, that question was only be answered with respect to the correlation between prenatal care and the dependent variables. The different types of prenatal care and their

Table 19  
 Tests of Significance of Correlation  
 in the Prediction of Infant's Mental Development

Variable	Regression Coefficient	t	p
Infant's Age	1.27	1.88	.06
Mother's Age	-.02	.04	.94
Mother's Rank Order	-.0.00	1.00	.31
Infant's Origin	.00	-.00	.99
Mother's Education	-.0.00	1.00	.31
Family Income	.76	2.40	.02
Maternal Support System	1.46	2.40	.02
Parental Organization	-.11.11	1.11	.26
Environmental Risk	-.11	-.20	.85

Table 1A

Test of Significance of Coefficients of  
Common Variables in Prediction of Infant's  
Feeding Development

Variable	Regression Coefficients	P	r
Mother's Age	1.36	0.60	.02
Mother's Sex	4.47	0.88	.07
Mother's Marital Status	-4.90	0.69	.07
Infant's Religion	-0.88	.96	.01
Mother's Education	0.09	.47	.43
Family Income	.01	1.71	.98
Social Support System	1.07	.33	.63
Parental Coping Strategy	-0.10	2.46	.93
Perceived Risk	.01	.91	.94

TABLE 17

Relative Importance of Types of Programs  
 (and of Possibilities of Infant's Mental Development)

Poly constructed	Difference between tests	t	
		1	2
Private Population—Adults Health	14.49	1.40	.97
Private Population—Neurosis Infant Care Prog.	10.34	1.20	.21
Private Population—Severe Frequency Test	26.26	2.66	<.01
Private Population—S.T.B. High Risk Group	9.04	.33	.33
Public Health—Neurosis Infant Care Prog.	6.20	.67	.50
Public Health—Severe Frequency Test	7.07	1.00	.32
Public Health—S.T.B. High Risk Group	10.70	2.49	.02
Neurosis Infant Care Prog.—Severe Freq. Test	11.12	2.54	.02
Neurosis Infant Care Prog.—S.T.B. High Risk Group	11.36	2.57	.02
Severe Frequency Test—S.T.B. High Risk Group	26.61	2.54	<.01

Table 8

How Social Management of Infection  
in Each Protected Care Group Affects  
Adjusting for Variables Specified by RCT  
Before Independent Variables

Protected Care Group	Mean
General Pregnancy Unit	148.83
Perinatal Medicine Department Clinics	120.76
Perinatal-Maternal Care Clinics	128.81
Perinatal Medicine	112.48
S.T.R. High Risk Clinic	111.83



abruptness) program are discussed in Chapter V.

The data did not support the hypothesis that either personal life status or the quantity of social support received by the mother was related to her transitions with her infant or the infant's development. In addition, it was found that an independent variable contributed to the prediction of the mother-infant transition process.

### The Prediction of Infant Development

The second multivariate multiple regression analysis was applied in order to ascertain the validity of the transition components in predicting infant development. This analysis was also designed to the questions regarding the mother's age and personal and personal variables as predictors of infant development when the various episodes of transition was perturbed but in the whole. The second analysis was designed to answer the following questions:

**Question Three:** What is the nature of the relationship between personal, medical care and development at six months after controlling for the age and education of the mother, the sex and birth order of the infant, ethnic origin, family income and personal trait?

**Question Four:** Which variables contribute predictive information to the identification of developmental delays in infant development measures at six months?

**Question Five:** Is there a relationship between the age of the mother and infant development after controlling for education, infant sex and birth order,

mother's education, perinatal risk status, ethnic origin, mother income, social support system and type of prenatal care and education?

The questions were answered by the usual multivariate multiple regression analysis. Mental and psychomotor development were regressed on mother's age and education, ethnic origin and birth order, sex, socioeconomic, respiratory vaccination, negative affect, neuroanatomical abnormalities, mother income, ethnic origin, social support system, perinatal risk status, prenatal complications and type of prenatal care from the multivariate tests of significance (Table 12). It can be seen that the age of the mother, prenatal complications, respiratory vaccinations and type of prenatal care contributed to the overall variations of mental development ( $p < .05$ ).

The results of the univariate analyses are presented in Table 13. This represents the contributions of mental and psychomotor development and revealed that both mental were significant. A visual inspection of the plots of the residuals indicated that the data met the assumption of homoskedasticity and were appropriate for the analyses.

The follow-up univariate analysis (R<sup>2</sup> = .51) of mental development (Table 14) was consistent with the first analysis and indicated that the age of the mother had a positive relationship to her infant's mental development. The plots of the residuals against mother's age indicated no deviation from homoskedasticity. It was therefore concluded that there was a positive linear relationship between the age of the mother and her baby's mental development. Mother's age was found to explain 51 percent of the variance in mental development. The regression

Table 18

Results of the Wilcoxon Significance  
Tests of Differences in the Infant's  
Health and Psychomotor Development

Variable	W	z	p
Health	1.29	0.37	.71
Reliability	.65	0.37	.71
Language Stimulation	1.12	1.37	.17
Physical Affair	.85	1.37	.17
Motor-sensor Stimulation	1.17	1.37	.17
Mother's Age	4.04	1.37	.17
Infant's Birth Order	1.64	1.37	.17
Sex of Baby	1.66	1.37	.17
Infant's Weight	.57	1.37	.17
Mother's Education	1.64	1.37	.17
Health Status	1.76	1.37	.17
Infant Support System	1.18	1.37	.17
Type of Prenatal Care	2.46	0.004	<.01
Prenatal Complications	4.00	1.37	.17
Prenatal Risk Status	1.11	1.37	.17

Conversion of Wilco<sup>2</sup> criterion to an F statistic

Table 35  
 Tests of Significance of  
 Contribution of Pensioners for Total  
 Corporate Surplus (a) Continued

Category	1	2	3
Work Development	45	1.45	100
Environment Development	40	1.10	95

Table 5

Table of Regression of Dependent of Continuous Variables in the Prediction of MEd's Social Development

Variable	Regression Weights	B	r
Gender	0.0764	4.07	-.04
Resilience	-.0079	.05	-.00
Impaired or Visual Location	.0003	0.04	-.00
Negative Affect	-0.0009	0.00	.02
Compassionate Transduction	.0000	.00	-.70
Mother's Age	0.0470	7.47	0.00
Father Index	0.0000	0.00	-.00
Religiosity	-0.0070	0.10	-.70
Mother's Education	-0.0011	0.10	-.00
Family Income	.0024	0.00	.00
Sex	.0773	.00	.00
Medical Support System	-0.0000	0.00	.00
Perceived Compliance	-0.0070	0.00	0.00
End	-.0000	0.00	.00

coefficients indicated that for each year of mother's age, the infants differed, on the average, by 1.8 points on the Bayley Development Index and by 1.2 points on the Psychomotor Development Index (Table 2).

Quoted in the text concerned with the relationship between parental flat and development is not correct. No significant relationship was found to exist between parental flat and either mental or psychomotor development.

The presence of parental complications (marital, trauma, infection or maternal disease) was found to have a negative relationship with the infant's mental development and accounted for 11 percent of the variance in deviations from linearity were introduced in the plot of the residuals against parental complications. It was therefore concluded that there was a negative linear relationship between parental complications and mental development. No significant relationship between parental complications and psychomotor development was found.

Respective vocalizations: the responses which indicated the behavior baby's vocalizations, mother's contingent vocalizations, and baby's contingent vocalizations, was found to have a positive relationship in the infant's psychomotor development and accounted for 11 percent of the variance. No significant relationship was found to exist between respective vocalization and mental development.

The type of parental care contributed to the prediction of both mental and psychomotor development. Pairwise comparisons of the four groups indicated that the mean of these infants score neither maternal response to a verbal stimulus played significantly lower on both mental and psychomotor indices than those who receive care

Table 10

Tests of Significance of Contributions to the  
Prediction of Goff's Population Breakdown

Independent Variable	Regression Coefficients	<i>F</i>	<i>p</i>
Years	1.168	4.6	.05
Age	-.0016	.75	.40
Response Variables	.0162	7.05	* .01
Response Effects	1.444	1.05	.30
Response Variables	.0019	1.15	.14
Years's Age	1.1759	3.75	.06
Age's Age	-4.7877	4.87	.04
Response	-2.1777	.88	.44
Response's Response	-1.1638	.84	.36
Response Effects	.1042	1.64	.11
Age's Age	-6.7881	4.77	.03
Response's Response	.0062	.09	.75
Response's Response	-6.0020	1.09	.30
Model	1.007	.09	.94

From Hospital and Infant Care Clinics and the Teenage Pregnancy Unit. Significant differences were also found to exist between Hospital and Infant Care Clinic patients and St. John's Teaching Hospital High Risk Clinic patients. The mean of the Teenage Pregnancy Unit infants was also significantly higher than the infants of St. John's Teaching Hospital High Risk Clinic. The possible explanations and the adjusted means are presented in Tables 23 and 24.

It should be noted that a discrepancy exists between the results of the first and second analyses with regard to the significance of the type of prenatal care as it related to psychomotor development. As inspection of the adjusted means for each prenatal care group (Table 23) indicated large, but nonsignificant differences in the descriptive responses. This variation was not accounted for in the first analysis. In the second analysis, partialling out the variance explained by胎周数 yielded a significant association between the type of prenatal care and the psychomotor development of the infant.

#### The Prediction of Developmental Delay

The question regarding factors in infant development could not be answered due to the fact that no infants scored below 40 on either the motor or the psychomotor scale. As a result of this analysis, however, certain variables have been identified which do contribute to the prediction of developmental risk in infancy. The variables which were found to be associated with negative outcomes in motor development were: 1) the young age of the mother, and 2) the presence of complications during pregnancy. Negative outcomes in psychomotor development were associated with a lack of antenatal



TABLE 11

Relative Importance of Types of Personnel Services  
on Infant's Mental and Populometric Development

Categories	Social Background		Mental Development	
	Differences Between Means	F	P	Relative Importance
Private Population--Public Births Department	16.32	1.42	.94	1.42
Private Population--General Infant Care Proj.	16.48	1.96	.96	1.96
Private Population--Nursery Program	11.31	1.57	<.001	1.57
Private Population--General Teaching Hospital	4.26	1.2	.91	1.1
Public Births Department--General Infant Care Project	6.46	.86	.34	.86
Public Births Department--Nursery Program	16.43	1.43	.94	1.43
Public Births Department--G. I. B. High Birth Clinic	16.79	2.86	.86	1.79
General Infant Care Project--Nursery Program	14.13	2.76	<.01	2.76
General Infant Care Project--G. I. B. High Birth Clinic	16.14	1.56	.92	1.56
Nursery Program--G. I. B. High Birth Clinic	11.66	4.36	.66	4.36

Table 3a

Means for Personal Care Groups after Adjusting for Variables Explained  
by Transcultural Assessment and All Other Independent Variables

Size of Personal Care	Neurol. Development	Psychomotor Development
Private Population	105.498	104.408
Public Health Department	102.474	100.494
Returned to Post-Care Clinics	106.692	111.174
Average Prepayment Team	102.427	101.429
Group's Functioning Impaired	116.760	105.309



realization in the mother-infant transaction process. It can be concluded that several of the variables contributed to the prediction of FLAR in infant development.

#### Mother-Infant Transactions as a Predictor of Infant Development

One of the fundamental questions investigated in this study concerned the relationship between mother-infant transactions and the mental and psychomotor development of the infant. The question addressed was:

Question Five: Are the transaction components of the mother-infant relationship—namely, sensitivity, responsive communication, negative affect, and nonreciprocal stimulation—associated with the psychomotor and mental development of the infant when controlling for mother's age and education, baby's sex and birth order, family income, ethnic origin, social support system, postnatal week, and type of prenatal care?

The preceding analysis was conducted to test the hypothesis that the transaction components predicted mental and psychomotor development in infancy when all other variables were held constant. The analysis involved testing the hypothesis for each dependent variable separately. The *F* statistics for mental and psychomotor development were 1.14 and 1.18, respectively and were compared to the

### Adjusted R-square

$$R^2 = \frac{[Sum\ of\ Squares\ (Full\ Model) - Sum\ of\ Squares\ (Reduced\ Model)] / 2}{[Sum\ Squares\ Error\ (Full\ Model)]}$$

Model 1

$$Development\ P = \frac{[2971.111 - 1010.158] / 2}{178.9145}$$

$$= 1.11$$

Model 2

$$Development\ P = \frac{[2304.855 - 944.855] / 1}{178.9145}$$

$$= 1.46$$

The critical value in  $F_{(1,81), .05}$  is 1.74. It was therefore concluded that the shared variance of the mother-infant transactions components (sensitivity, reciprocity, responsive vocalization, negative affect and nonresponsive stimulation) contributed to the prediction of the infant's psychomotor development, but did not contribute to the prediction of the infant's social development.

Follow-up tests (Tables II and III) supported only the hypothesis that the unique proportion of variance accounted for by responsive vocalization contributed to the prediction of psychomotor development. Responsive vocalization accounted for 11 percent of the variance in psychomotor development. Based on the positive regression weights, it can be concluded that there is a positive relationship between responsive vocalization and the infant's psychomotor development. In conclusion of the research phase followed that the relationship between the two variables was direct.

### Summary

The studies presented in this chapter were designed to ascertain the strength and nature of the relationships of the age of the mother,

parental and perinatal factors and environmental, maternal and situational factors in mother-infant transaction and infant development in an age-specific sample. In the first analysis, the nature of transaction and development were considered in relation to outcome measures of early pregnancy and parenting. Infant development was found to be associated with the age of the mother, the type of prenatal care received by the mother and parental cognitions. No variation was found in associations in the prediction of infant's psychomotor development and the mother-infant transaction process.

The second analysis was concerned with the prediction of the developmental outcomes of the infant. Several variables were found to be associated with the infant's development. The variables which were identified as predictors of mental development were: 1) the age of the mother, 2) the type of prenatal care received by the mother, and 3) the presence of parental cognitions. Psychomotor development was found to vary as a function of: 1) exposure to stimulation of the mother-infant transaction process and 2) the type of prenatal care received by the mother.

The functions of mother-infant transaction were found to contribute a significant proportion of shared variance to the infant's psychomotor development. The component of transaction which contributed a uniquely significant proportion was maternal stimulation. The results of the study and their implications for future research and intervention are discussed in Chapter V.

## CHAPTER V DISCUSSION AND IMPLICATIONS

In this study, the most important questions were answered with the multifactorial outcomes of early pregnancy and parenting. The study was designed to explore the relationship of the age of the mother, prenatal and perinatal factors and environmental, social and educational processes to the dimensions of mother-infant interaction and the development of the infant. This research reflects an effort to enhance our understanding of the young mother and her infant and, as a result, design more appropriate and comprehensive support services to the young family. The findings of the study and their implications are discussed in this chapter.

### The Age of the Mother as a Predictor of Infant Development and Mother-Infant Interaction

The most important questions posed in Chapter I were "What are the behavioral characteristics of the very young mother? . . . how does she relate to her baby and what is the association between her style of mothering and her baby's development?" The questions addressed several dimensions of early family development:

In the First analysis, which related communication and development to various measures, as particularly to mother-infant transaction and found it to related to mother's age

The age of the mother did, however, contribute to the maturation of her baby's mental development when intelligence was considered as a dependent variable. The age of the mother was also associated with her baby's mental development when the proportion of variance attributed to her mother-infant interaction was held constant. The data suggested that the subjects of younger mothers were less competent as a measure of mental development and that, as mother's age increased, so did the infant's mental development.

The problem of multicollinearity could not be dealt with adequately in this study due to the need for an extreme large data set. It is therefore difficult to know the unique contributions of mother's age and education, ethnic origin, birth order, parity, income and parental complications. For instance, it remains unknown whether the infant's development is threatened by the fact that the mother is young or if development is threatened by the mother who is young as a potential pregnancy due to poor nutrition (anemia and toxemia), infections and maternal disease. Specifically, the authors who are more likely to have complications during pregnancy and have fewer material resources also have more to threaten the mental development of the infant.

The significance of the association found between mother's age and the infant's mental development is in accord with other research concerned with the infants of adolescent mothers (Hasty et al., 1991). The implications of the present findings warrant a need for early and intense developmental and educational interventions programs which are designed to enhance the competence of the children of young mothers in order to prevent long term hindering conditions.



The findings of this and other studies (Clarke-Stewart, 1979; Isabella et al., 1976) have demanded the protection of the transaction process to enhance infant development. We therefore have support for the concept of parent and infant-centered approaches to early intervention. The findings of this study also suggest that the dimensions of mother-infant transaction parallel across the age of the mother and that the young mother is as adept in her ability to facilitate positive transaction with her infant as her "of age" peer. The strength of the mother-infant relationship is perhaps one that is able to be focused on in our attempts to help mothers enhance their infant's mental competence. As professionals, there is often little we can do to modify the inevitable (environmental) restriction and biological threat due to prenatal complications that exists in infant development. We can, however, support young mothers in their transition to parenthood and their development of a transactional relationship which is supportive to the infant and thus facilitates of their infant's development.

Emotional and Functional Factors and Socioenvironmental, Medical, and Educational Aspects as Predictors of Mother-Infant Transactions and Infant Development

Previous research regarding early parenting revealed the mother's social support system and the professional members she interacts to have a relationship both to her development as a mother and her infant's competence (Furthman, 1979; Ginzburg, 1976; Isackson and Jester, June 1, 1971 and Feb. 1972). These questions

was investigated in this study, is still. The data collected on significant relationship between the quantity of social support and development and transmission. This was surprising and suggests that perhaps the kinds of social support not quantified--collaboration, concern and children's confidence--and not an appropriate measure of the qualitative aspects of support, which have been associated with family development. An additional instrument to measure the qualitative characteristics of the mother's social support system would assist in future studies.

The findings indicated the positive association between more comprehensive models of parental care and the mental and psychosocial competence of the infants. The most significant differences in infants' mental and psychosocial development were found to exist between parental care which offered only structured services and those which included either an optional or a mandatory parental and childlike education program. The highest mean on infant development were found to be those of infants whose mothers received care in the model which included parental and prospective parenting education as well as social service referral, confidential and short-term crisis counseling (Hogan, 1984: 12).

In interpreting this finding, it is important to note that a consistently larger proportion of the initial sample of the Private Population care group patients participated in this study than those who received other types of care. This suggests that the findings reflect those of more motivated mothers in the study.

four groups, whereas the measures taken on children patients suffering from chronic infection. Another consideration is on taken into account is the fact that subjects were self selected into each type of parental care group on the basis of socio-economic status and geographic location. Consideration of these variables should also be based on the fact that the design of the study was retrospective and as such, no causal inferences with respect to differences between groups can be made. The outcome can be said to be associated with the presence or parenting education component of the models due to the fact that these variables were excluded from the analysis. These results do, however, suggest a need for more controlled experimental designs which would permit the investigation of the effects of interdisciplinary service models on the parent-child relationship and infant development.

### The Conclusions of Developmental Risk in Infancy

The members of this study indicated that the young age of the mother, the presence of parental complications and a lack of supportive interactions in the mother-infant transaction process are associated with negative outcomes in infant development. It was surprising that as infants in this sample (which consisted of many low income mother distressed mothers) entered it as being at (the clinical criterion for delay) as the Bayley Scales of Infant Development. Several possible explanations of this source mention the possible cause is that the measure tested high. This consideration, as well as the fact that the infants participated in 11 minutes of free play prior to the assessment, may still have

estimated the infant's level of optimal performance which was stated to be 4 pct. of the maximum (Bayley, 1967). A third consideration is the small number (26 of 150) of high risk infants (those who were born prematurely or had neonatal complications) who were selected as members of the limited sample. Of the 16 high risk infants sampled, four participated in this study. The data were unable to answer the question and the identification of delay as an age specific sample that remains in need of future investigation.

Of benefit to our knowledge base would be the longitudinal assessment of the infants of adolescent parents. That these infants are at risk has been well documented in the literature. The findings presented in this study indicated that differences exist as early as six months of age. It is the subjective opinion of the author that a major benefit to the success of parent follow-up lies in the direct communication by telephone to observe those of services offered to the family. In explaining the procedures initially, questioning may be initiated and parents say to each to find that they were "lucky" to be chosen. This approach was used successfully in a seven year follow-up of the Deliberative Perinatal Study (Sullivan, 1977).

A more thorough consistent battery for long term follow-up would be as useful as well. The use of the Infant Profile in the Bayley Scales of Infant Development and its relationship to mother-child interaction in mother employed area of early parenting. The utility of an instrument to assess descriptive characteristics

of social support should contribute to future investigations and field research interventions.

An analysis of the activities (language, social, cognitive and gross and fine motor skills) of the mother and psychomotor behavior would be of assistance in order to make early developmental interventions more appropriate for each individual infant and family.

#### *Mother-Infant Interaction as a Predictor of Infant Development*

The relationship between mother-infant interaction and infant development was one of the most important questions in this study. The findings revealed numerous associations in its positivity related to the infant's psychomotor development. The overall contribution of the mother-infant transaction components was also found to be related to the infant's psychomotor development.

The results of this study support the idea that the mother-infant relationship is important to the infant's development of competence. We also have reasons to believe that early comprehensive interdisciplinary models of prenatal and perinatal support are associated with enhanced development of the infant. These findings suggest several considerations in the design of prenatal and infant-centered interventions for the young parent family. There is reason to believe that early and prolonged interventions with young parents and their infants can enrich the quality of care and stimulation provided by the mother and thus enhance the development of her infant.

### Summary and Conclusions

The findings document in this study indicate that there is a need to reach both parent and child at the earliest possible moment and in a more comprehensive approach. For in this way, undoubtedly will be given the opportunity to develop to their maximum potential. Meeting the special needs of the young parent family presents a multifaceted challenge to efforts on the part of the professional community.

Although the findings of this study do not indicate the extended family to be of importance, a special concern with the adolescent mother is that our efforts must be focused toward not only the young mother, but the father of her baby and the members of their extended families, as well. That was underscored in the studies of Furstenburg (1979, 1980) and Delandshere (1979). When that will mean extensive coordination of all phases of the clinical, school and home-based programs. In this way, the quality of care provided by nurses were truly comprehensive in nature.

At the heart of this approach is the primary provision of early pregnancy--home support and home program services. Individuals who are equipped for the tasks of parenthood. With the formation of confidential family planning services and curricula designed to deal with the issues of teen sexuality and family development, it is anticipated that young people will become more responsible in their sexual activities.

Our purpose here was to explore the role of the adolescent as a mother and her baby's development. As noted earlier, the philosophical

goals of this study was a strong belief in the positive characteristics of the young parents--energy, enthusiasm, adaptability and, above all, an optimistic view of the future. It is hoped that the results of this study and the literature presented herein will allow our future efforts to focus on the qualities of the mother-infant relationship in order to enhance the development of the infant and strengthen the family.

It is important to remember that these young women have chosen to continue their pregnancies and undertake the tasks of motherhood. However, too, that most individuals, regardless of age, come to parenthood relatively unprepared for the responsibilities of caring for and nurturing another human life. The positive growth and development of these young parents and their children is dependent upon our intensive supportive efforts to support them in a developmental manner as they grow together as a family.

APPENDIX A  
PARENT CONSENT FORM

The first months of life are important as children grow. For that reason, we would like your permission to study how your baby's body and what are developing. The study involves making a videotape film a television film of you and your baby playing and using the Bayley Scales of Infant Development to study your baby's mental and physical abilities. We will be happy to answer any questions before, during or after the study. You will be informed of the results of the study and will be sent a photograph of you and your baby and a book of baby milestones, games and learning activities.

We are looking forward to working with you and your family and hope you will agree to be a part of our study. If you will agree to participate, please sign below.

In the event of sustaining a physical injury which is permanently caused by this experiment, professional medical care will be provided for up to the \$ 25,000 Miller Smith Center. There will be no charge to you, exclusive of hospital expenses.

I, \_\_\_\_\_, have read and understood the informed consent statement and give my permission for studying my child and using the information and videotapes for research and teaching purposes. I also realize that I may change my mind and withdraw my permission at any time.

Witness \_\_\_\_\_ Signed \_\_\_\_\_

Witness \_\_\_\_\_ Insignificantly \_\_\_\_\_  
to Child



Name \_\_\_\_\_

Address \_\_\_\_\_

Telephone \_\_\_\_\_

Six Month Assessment  
Child and Family Development Evaluation  
JILL McHALE  
Department of Obstetrics and Gynecology and  
Pediatrics

\_\_\_\_\_ Screen form

\_\_\_\_\_ Parent's Questionnaire

\_\_\_\_\_ Playley Scales of Mental and Motor Development

\_\_\_\_\_ Videotaped Recording

\_\_\_\_\_ Infant Assessment of Horizontal Gaze

Selection Process

Mothers will be contacted by mail one month prior to test date. They will be mailed the consent packet one week prior to testing and please to confirm the appointment two to three days prior to testing.

Upon arrival to the Pediatric Clinic, they will be brought into the Developmental Plastic Playroom and the Development Specialist will explain the procedure for the Playley videotape and Playley Scales of Infant Development. Upon agreeing to participate in the study, the mother will be asked to sign the consent form.

The Playley situation will be videotaped and the developmental instrument administered. The Developmental Specialist will then take the family into the waiting room and explain the results of the assessment, show the mother learning activities which are taped onto the

the developmental strengths and weaknesses, and give the reader detailed descriptions of the activities constructed. Following the assessment, authors will be interviewed to obtain demographic information.

**Child and Family Development Questionnaire**  
**For Youth Evaluation**  
**JULIE WEISSBERG**

1. Boy/Girl's Name \_\_\_\_\_ 2. Mother's Name \_\_\_\_\_  
 3. Date \_\_\_\_\_ 4. Mother's Age \_\_\_\_\_  
 5. Boy's Birth Date/Time \_\_\_\_\_ 6. Boy's Age \_\_\_\_\_  
 7. Boy's Birth Date \_\_\_\_\_ 8. Boy's Age \_\_\_\_\_

**10. What is your ethnic origin?**

\_\_\_\_Slavic Am \_\_\_\_Porto Rican \_\_\_\_Latvian \_\_\_\_Other  
 \_\_\_\_Black Am \_\_\_\_Asian \_\_\_\_Cuban \_\_\_\_Filipino  
 \_\_\_\_Am Indian \_\_\_\_East Indian \_\_\_\_Mexican

**What is your father's ethnic origin?** \_\_\_\_\_

11. Are you \_\_\_\_\_ married \_\_\_\_\_ single \_\_\_\_\_ living with 1 or both parents  
     \_\_\_\_living with boy's father \_\_\_\_\_ living with mother \_\_\_\_\_ living with relatives \_\_\_\_\_  
     \_\_\_\_living with friend \_\_\_\_\_  
 12. How often do you share a home? \_\_\_\_\_ with my mother \_\_\_\_\_ father \_\_\_\_\_ brother(s)  
     (Check all that apply) \_\_\_\_\_ mother \_\_\_\_\_ sister(s) \_\_\_\_\_ all three  
     \_\_\_\_live alone \_\_\_\_\_ friend(s) \_\_\_\_\_ grandpa(s) \_\_\_\_\_ grandmom(s)  
     How helps care for your baby? \_\_\_\_\_ in home \_\_\_\_\_ day care \_\_\_\_\_ friend \_\_\_\_\_  
     \_\_\_\_\_ other \_\_\_\_\_

13. In what type of residence do you live? \_\_\_\_\_ home \_\_\_\_\_ apt \_\_\_\_\_ shelter  
     \_\_\_\_\_ group home \_\_\_\_\_

14. How much school have you completed? (Please circle highest level.)

\_\_\_\_1\_\_\_\_2\_\_\_\_3\_\_\_\_4\_\_\_\_5\_\_\_\_6\_\_\_\_7\_\_\_\_8\_\_\_\_9\_\_\_\_10\_\_\_\_11\_\_\_\_12\_\_\_\_  
     \_\_\_\_Unfinished High School \_\_\_\_\_ Jr. College \_\_\_\_\_  
     \_\_\_\_Unfinished College \_\_\_\_\_ Bachelor's \_\_\_\_\_  
     \_\_\_\_Degree \_\_\_\_\_ Master's \_\_\_\_\_ Ph.D. \_\_\_\_\_

How much school did your baby's father complete? \_\_\_\_\_

15. Are you still in school? \_\_\_\_Yes \_\_\_\_No \_\_\_\_Yes

16. What is your total family income? \_\_\_\_\$1,000 \_\_\_\_\$1,000 \_\_\_\_\$1,000  
\_\_\_\_\$4,000 \_\_\_\_\$4,000 \_\_\_\_\$4,000 \_\_\_\_\$7,000 \_\_\_\_\$4,000 \_\_\_\_\$4,000  
\_\_\_\_\$10,000 \_\_\_\_\$10,000 \_\_\_\_\$12,000 \_\_\_\_\$11,000 \_\_\_\_\$11-14,000  
\_\_\_\_\$14-18,000 \_\_\_\_\$18-22,000 \_\_\_\_\$20,000 \_\_\_\_\$22-24,000  
\_\_\_\_\$24-28,000

17. What are your income sources? \_\_\_\_self-employment \_\_\_\_<sup>name of</sup> husband's salary  
\_\_\_\_MPC \_\_\_\_MC \_\_\_\_<sup>fund</sup> group \_\_\_\_<sup>husb's father's</sup> parent/family fund

18. Where did you receive prenatal care? \_\_\_\_<sup>private</sup> physician \_\_\_\_<sup>public health</sup> clinic  
(Please indicate frequency) \_\_\_\_  
\_\_\_\_MPC Clinic \_\_\_\_PH or Clinic \_\_\_\_MPC Clinic

19. Where does your baby receive health care? \_\_\_\_<sup>private</sup> \_\_\_\_<sup>public</sup>  
\_\_\_\_<sup>public</sup> clinic \_\_\_\_PH from clinic

20. How have you participated in our Prenatal Education or Support Program?

\_\_\_\_prenatal ed. class \_\_\_\_MPC Clinic  
\_\_\_\_childbirth ed. class \_\_\_\_clinic  
\_\_\_\_psychological or child development \_\_\_\_religion  
\_\_\_\_radio, TV, newspaper \_\_\_\_church  
\_\_\_\_home, community/social services \_\_\_\_community ed.

When was this program lastest?

How often did you participate?

APPENDIX B  
DEFINITIONS OF BEHAVIOR AND REPORT MEASUREMENT

Infant Feeding Behavior Scale

General Behaviors

1. Engaging: positive verbalizations; all positive nonverbalisms including questions, praise, requests, demands, etc.
2. Comments: mother-oriented, direction and descriptive verbalizations clear in relation to current action.
3. Chiding: clear request to terminate action or verbalizations about an object or person or descriptive
4. Encouraging/help: positive touch, help, facilitation, provide
5. Interfering/ignore: self-oriented maternal behavior; getting baby's attention to some unrelated obj., action which draws baby to a different stimulus rather than attending baby's behavior
6. Repetitive/parallel/help: repeating the same or similar obj. over and over for several 10-second periods. This has a monotone quality, such as presenting different toys one after the other in a very similar manner
7. Encouraging/tease: rapid series of maternal behaviors which elicit baby's or no. time for infant response
8. Stimulation/tease: kiss, pat, hug, stroke, etc.
9. Interfering/tease: mother teaches baby to distract, inhibit ongoing activity. Includes hitting, waving object from hands, pulling back, etc.

12. Regulation verbalizations: brief phrases repeated over and over for most of a 12-month period

### Infant Behaviors

11. Not in synchrony: requests for help, reach, point, or stare, positive gestures
12. Nonintentional: nonconscious vocalization, babbling, gurgling, cooing
13. Signs of anger: not showing, not preening...
14. Self-orienting behavior: thumb sucking, extended looking or when not-task-oriented or exploratory behavior...
15. Facial behavior: smile or frown or facial expression, baby is not interacting with caregiver or environment...
16. Exploring: looking about or actual exploration of environment
17. Crying: crying or fussing, not developed as action behavior

### Behavioral laboratory

18. Neutral position regarding: complete response to infant positive bid or distress in a positive manner by protecting, giving, warning, helping, accepting, etc. Does not include hostility, avoidance, or rejection baby's vocalizations or behaviors
19. Minimal maternal response: ignoring or rejecting baby's vocal bid or nonpleasurably either verbally or nonverbally Examples: not responding to her calls while baby cries softly, turning away, or sleeping a baby's latencies...
20. Neutral ignoring: neither ignores baby nor hostility of baby
21. Baby positive stimulation: baby responds to mother's bid positively or smiling, reaching, pointing, vocalizing, etc.

- 12 body's attitude, responding: body responds to mother's act by drawing, crying, turning away, etc.
- 13 body, reacting: response to activity of mother
- 14 face-to-face orientation: mother is in a position facing baby.
- 15 vertical gaze: the two faces are in the same vertical and horizontal plane.
- 16 mother's contingent, reciprocal or indirect vocalization: mother either initiates or responds vocally to mother's vocalization by action.
- 17 body's contingent vocalization: baby either initiates or responds vocally to mother's behavior.

## APPENDIX C

### BASIC SKILLS OF ADULT DEVELOPMENT

#### A. Manipulative Skills

Item	Age Range	Item Description
7b	4-5	<p>Take <u>partial</u> thumb opposition. (partial griping). With the child seated at the table, place a towel into <u>across</u> his <u>very</u> reach. Also advise if he passes Item 7a</p> <p>Credit: at this level if the child picks up the edge with his thumb partially opposed to his fingers, using the palm as well as the thumb and fingers.</p>
7c	5-6	<p>Take <u>no</u> starting position. Stand at the foot of the table and lean over the child who is to bring up his back. Give his <u>post</u> thumb to grasp. With this support, allow him to walk toward to a <u>stable</u> position and, if he is able, to a full standing position (Item 8a). Gradually <u>raise</u> your hand as the child pulls, but take care not to do the pulling for him</p> <p>Credit: if the child pulls himself to a sitting position with the support of your hands</p>
8a	5-6	<p>Take <u>thumb</u> <u>independently</u>. (Independent as in Item 7c)</p> <p>Credit: at this level if the child sits <u>independently</u> without support</p>
8b	5-6	<p><u>Independent</u> reaching</p> <p>Credit: if the child reaches to reach with one hand <u>more</u> often than <u>independently</u> (with both hands or mouth). The hand used need not be consistently within the right or the left</p>
8c	5-6	<p>Attempts to <u>secure</u> object. Place a sugar packet on the table <u>across</u> your reach of the child. Motivate his efforts to pick up the packet. If necessary, attract his attention to it by <u>moving</u> it the least, by tapping the table near the packet, or by saying: "Look! Can you reach that one?"</p> <p>Credit: at this level if the child makes an effort to pick up the packet, whether successful or not</p>



26. 4.2 Releases object.
- Credits: if the child releases his object freely in manipulating (e.g. color, weight, ball).
27. 4.4 Sets object 20 inches or more. Anticipation as in Item 27.
- Credits: at this level is the child sets object 20 inches or more. Note the level at which the child's look is turned so he looks forward (e.g. support).
28. 4.4 Sets from back to stomach. Anticipation as in Item 28.
- Credits: If, under this or any earlier criterion during the assessment period, the child shifts from the back into his stomach.
29. 4.4 Slip alone, steadily. Anticipation as in Item 27.
- Credits: at this level is the child can move steadily without support and with his back fairly straight.
30. 4.4 Scoops pellet. Anticipation as in Item 28.
- Credits: at this level is the child scoops the pellet with a rolling or sweeping palm movement. Also credits if he grasps (see 34 or 41).
31. 4.2 Sets alone, good coordinations. Anticipation as in Item 17.
- Credits: at this level if the child sets alone steadily while manipulating (e.g. tapping, or engaging in other actions that take his attention away from the starting process itself).
3. Handed-feeding
32. 5.5 Transfers object hand to hand. During the child's play with the blocks, dolls, or other objects, observer should be charged the object from one hand to the other.
- Credits: If the child transfers an object from one hand to the other 5 or more times. It not applies if this occurs only when the two hand were in contact with the object by chance.
33. 5.7 Picks up cube directly and directly. Picks a cube on the table within two reach of the child. Shows the manner in which the child picks up the cube (Observe Scale Items 18, 20, or may also be presented at this time).
- Credits: if the child picks up the cube directly and directly.

7. 3.1 Licks string. - observes string. - Administrator as in item 67.
- Grids: If the child observes the string as the result of his own actions, even though there is no evidence of purposeful use of the string.
7. 3.2 Grasps in mouth prehensile. - Observes stringing the small latencies with objects or tube wires.
- Grids: If the child shows intention to produce a result in mouth, by bringing tube, string the ball, etc.
7. 3.3 Lifts cup with hands. - Administrator as in item 68.
- Grids: If the child lifts the cup by the handle, using one hand prehensile.
7. 3.4 Attempts to scribbles. - Place a piece of paper on the table in front of the child. Then place a crayon on the paper with the tip pointing away from him. If he makes no effort to hold the crayon to the paper, take the crayon and scribble plainly with obvious scribbles. Then give the crayon to the child with instructions [by word and picture] to scribble. (See also item 69.)
- Grids: If the child attempts to do the described scribbling.
7. 3.5 Looks for fallen spoon. - Administrator as in item 68. (Note that items 62 and 73, describing both "play" and feeding, are because these items 62, 64, 71, and 73, which test "play" and "feeding" by visual only.)
- Grids: If the child deliberately looks for the fallen spoon by turning and looking to the floor.
7. 3.6 Playful response to mirror. - Administrator as in item 68.
- Grids: If the child plays with the mirror image, with such responses as laughing, smiling, laughing, playful reaching, leaning toward the image, touching the mirror, etc.
7. 3.7 Releases 1 of 2 cubes offered. - On day 1 + 1, place 2 cubes on the table before the child, allowing him to pick up each one before the next is offered. Observe his behavior when he has a cube in each hand and the third cube is presented.
- Grids: If the child releases the third 1 cube after the child is offered. (If the child holds the 3 by dropping a cube to touch the 3rd cube.)

APPENDIX B  
PEDIATRIC RISK SCORING  
Revised March 2004

Patient's Name \_\_\_\_\_ Age/DOB # \_\_\_\_\_ Date \_\_\_\_\_

**1. Presenting Factors**

1. Trauma (reference to trauma)	10	12. Age 2, 35 or $\geq 35$	1
2. Glaucoma (reference to)	10	13. Fluid drainage	1
3. Medication (ref. to)	10	14. Anemia	1
4. Surgery	10	15. Extensive drug use	1
5. History	10	16. TB history	1
6. Rx exchange	10	17. Rx 100 or 100	1
7. Patient information	10	18. Pulmonary disease	1
8. Information source	10	19. Eye exposure	1
9. Alcohol (ref. to)	10	20. Smoking 1 pack/day	1
10. Social history	5	21. Alcohol	1
11. Medical control (ref. to)	10	22. Medical history	1
12. Multiple pregnancy	10	23. Infection	1
		24. Before birth disease	10



## IV. Petal Features

1. Overall presentation	10	8. Petal independence 30 min	10
2. Multiple pregnancy	10	9. Operative tempo at maxim extraction	5
3. Petal independence 30 min	10	10. Inrush delivery sym- ptoms if isolated	5
4. Inrush delivery total extraction		11. General condition	5
5. Perigonal area	10	12. Genital tempo	5
6. Petal weight $\approx 1000$ gm	10	13. Shoulder dynamics	5
7. Petal activity at $t = 1.10$	10	14. Total duration	10

## V. Cervical Features

A. Overall		B. Cervix	
1. 1000 gram	10	1. 100	10
2. Age at $t = 1.4$	10	2. Cervical expansion	10
3. Cervicalization	10	3. Cervical pressure	10
4. 2000-1000 gram	10	4. Accumulation of respira- tory apnea	10
5. Petal expansion	10	5. Apnea	10
6. 1000-1000 gram	5	6. Transient hypoxia	5
7. Symmetry	5	C. Cervical Rotation	
8. Age at $t = 1.5$	5	1. Expansion	10
9. Feeding position	5	2. Expansion	10
10. Multiple signs	5	3. Hypertension	5
11. 2000-1000 gram	5	4. Hypertension	5
		5. Failure to gain weight	5
		6. Difficulties	5

## 2. *Carlini*

1. Major Carlini Associates	10
2. CCR	10
3. Petrusini, Stephen	4
4. Major Carlini Associates subliminal advertisement	5
5. Name	5

## 3. *Scientology Religion*

1. Scientology Religion, 10	10
2. Scientology Religion	10
3. Church of Scientology	10
4. Name	10
5. Name	4

## 4. *Scientology Religion*

1. CCR Religion, 10	10
2. Religion	10
3. CCR Religion, 10	5

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#### BIOGRAPHICAL SKETCH

Julia Ann Robinson was born in Jacksonville, Florida, in 1922. Together with her parents, Anna and Herman, and younger brothers Andy and Leroy, she resided in Jacksonville as well as Long Island, New York, and Boston, Massachusetts. She received her B.S. in Elementary and Early Childhood Education from Florida State University in 1943 and her M.Ed. in Early Childhood and Elementary Education from the University of North Florida in 1973.

Julia taught third grade and kindergarten in Orange Park and Jacksonville. She also taught early childhood education at the University of North Florida as an adjunct instructor in the Department of Elementary and Secondary Education.

Upon completing her doctoral program, Julia was a senior leader in the Childhood Education Program at the University of Florida. From September 1981 until June 1989, Julia served as Infant and Family Development Specialist of the Childhood Program Team in the Department of Elementary and Secondary Education. During this time she also worked as a graduate research assistant in infant development for the Department of Education, Division of Research. Throughout the year, Julia taught and supervised graduate students in Early Childhood and Family Development Education in the Department of Early Childhood Education.

From her two College Degree certificates, two Julia's professional goals include the continuation of research, teaching, and clinical experience with young children and their families.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

  
Albert B. Becker, Chairman  
Department Professor of  
Curriculum and Instruction

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

  
Albert B. Becker  
Associate Professor of  
Foundations of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

  
Patricia T. Walker  
Associate Professor of  
Foundations of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

  
Robert L. Smith  
Associate Professor of  
Philosophy

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

  
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This dissertation was submitted to the Graduate Faculty of the Department of Curriculum and Instruction in the College of Education and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

August, 1979

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Date, Student Signed